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TECHNOLOGY FOR HIGHER EDUCATION

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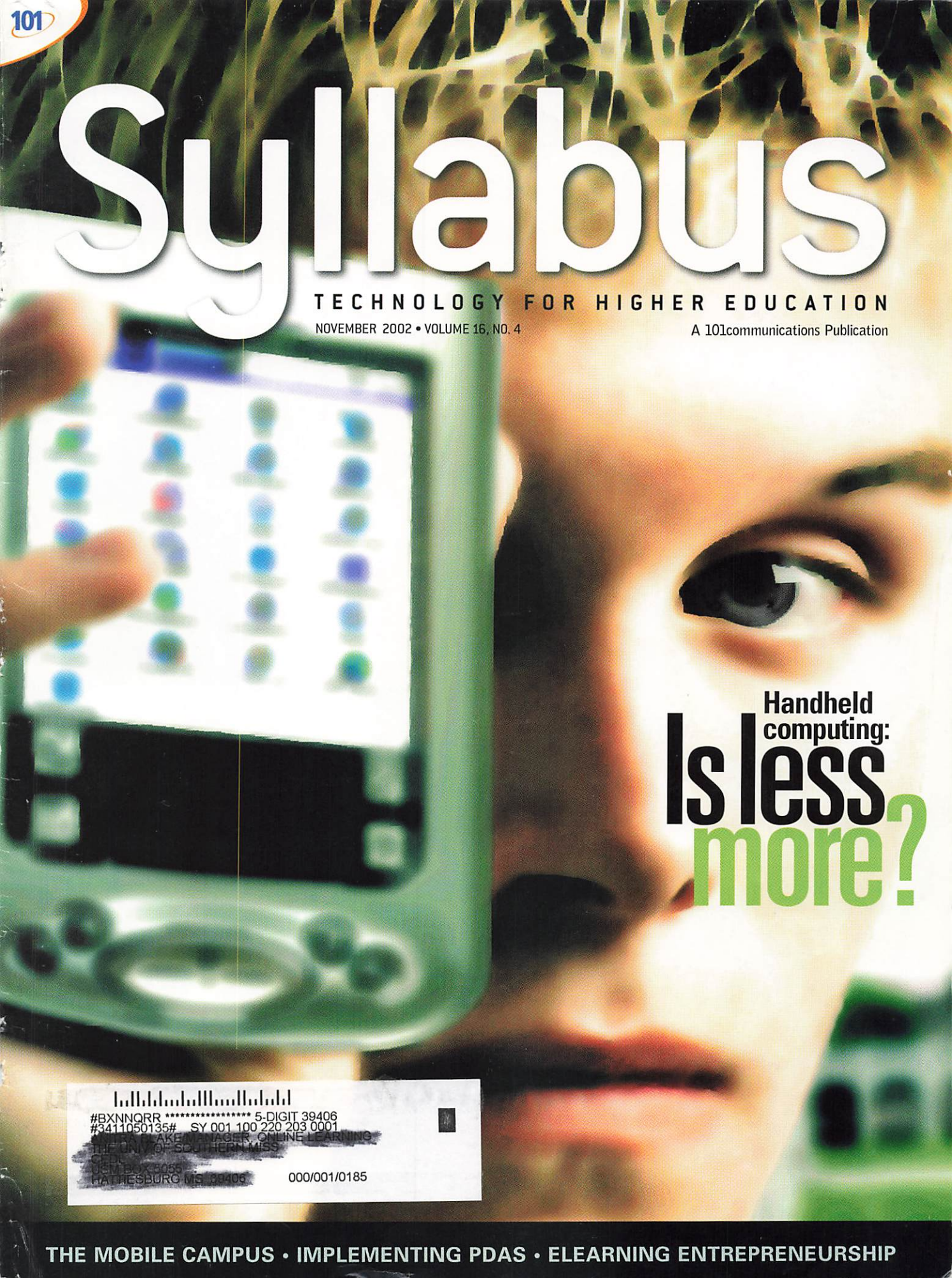

Handheld computing: Is less more?

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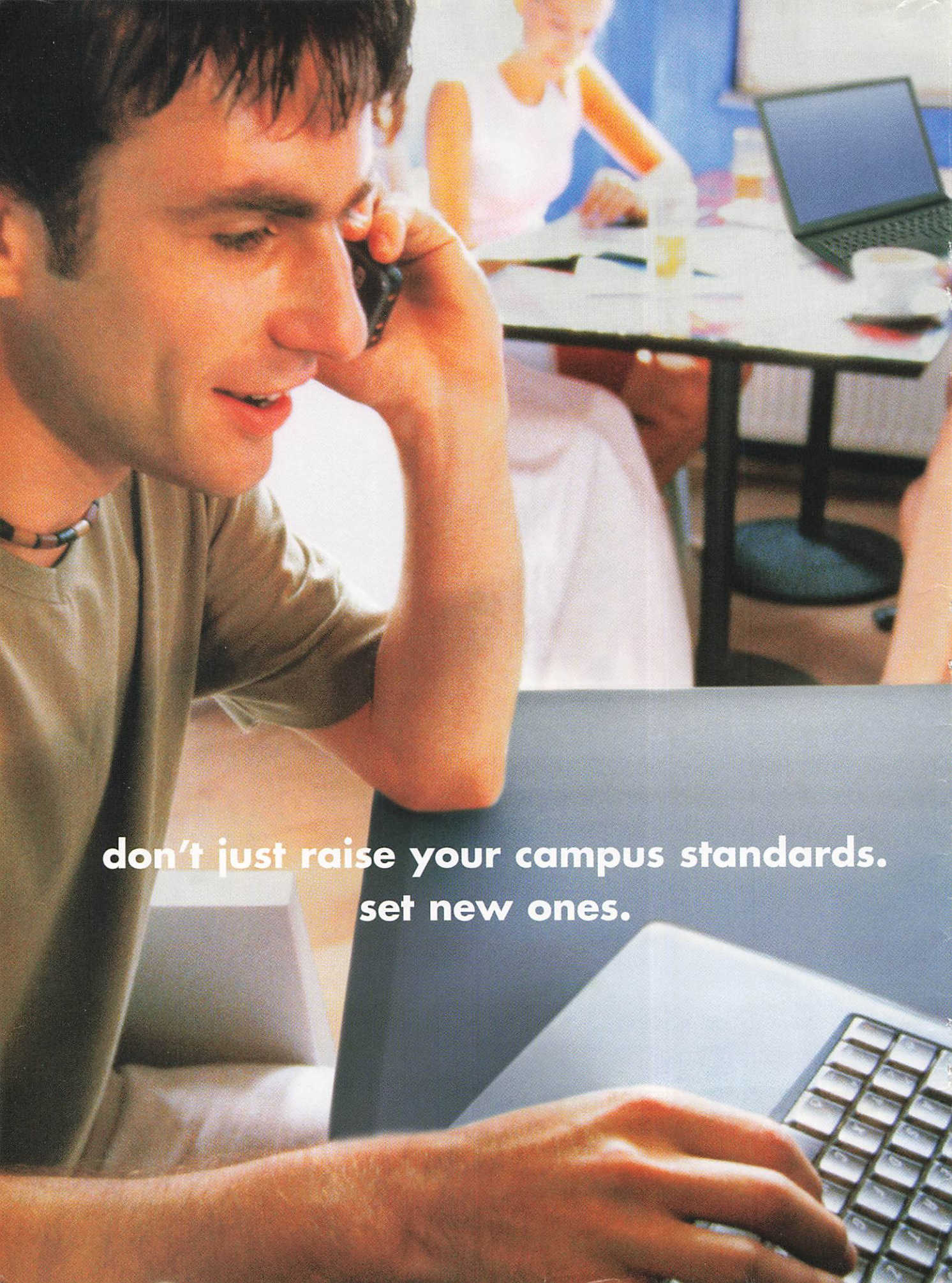
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EDITOR'S NOTE

Mary Grush, Editor

Personal computing devices are virtually "a given" on college and university campuses today. Almost all students, faculty, and staff own or have access to a computer—but not all choose the bulky desktop boxes we've become accustomed to. Smaller, lighter, and more powerful notebook computers and handheld devices—along with wireless access—have contributed to a quiet revolution: the trend toward a more mobile campus community.

This kind of pervasive computing environment can be served by numerous types of tiny, lightweight, yet powerful devices—not only laptops, but handheld computing devices and PDAs are growing in functionality and dropping in price. But will these "smaller, faster, cheaper" handheld devices offer real benefits for education? Is less more? In our lead feature article, "Handheld Computing: Toward a More Mobile Campus" (page 10), Mary Fallon looks at how powerful little handheld computers and PDAs are being accepted in higher education.

Today, you'll find students studying outside the dorm on the lawn, or in the library, or in collaborative groups—which of course they've done before, but now they can carry their computers with them, often complete with wireless connectivity to the campus network. And these users are better connected to campus resources, faculty, administrative services, and to each other than ever before. In "Implementing PDAs in a College Course: One Professor's Perspective" (page 16), University of South Dakota professor Doug Peterson shares some lessons learned from one year of working with USD's PDA program.

Also in this issue, we'll take a look at the role of entrepreneurship on campus. In "A New Lesson for eLearning Programs: 'e' is for Entrepreneurship" (page 24), Evan Robinson explores how creativity and entrepreneurial thinking can help offer new support for existing programs and open untapped markets.

Have you visited the Syllabus Web site recently? We're proud to announce the launch of our new Web site. It's got a fresh, clean look and several new features that we hope will provide access to more resources as well as facilitate discussions of education technology. Interactive forums, new content resources, and an events calendar will both supplement *Syllabus* magazine and offer Web-only content. Go to www.syllabus.com—visit now and return often!

The Call for Papers for Syllabus2003 can also be found on the Syllabus Web site—and in this issue, on page 40. Proposals are due November 30th. This year's conference is our tenth annual, and to celebrate, we are returning to our academic roots by holding the conference on the campus of Stanford University, July 26-30. Watch for updates about this exciting event in *Syllabus* and on the Web site.

Enjoy this issue of *Syllabus!*

Mary Grush

Letters to the editor should be addressed to the editor and sent to 101 First Street, #605, Los Altos, CA 94022, or via electronic mail. We reserve the right to edit all submissions. **News and product information** will be considered for publication. Please send all materials to Paul McCloskey. If you are interested in writing for *Syllabus*, please send a brief description of your article idea along with writing samples to the editor at the above address.

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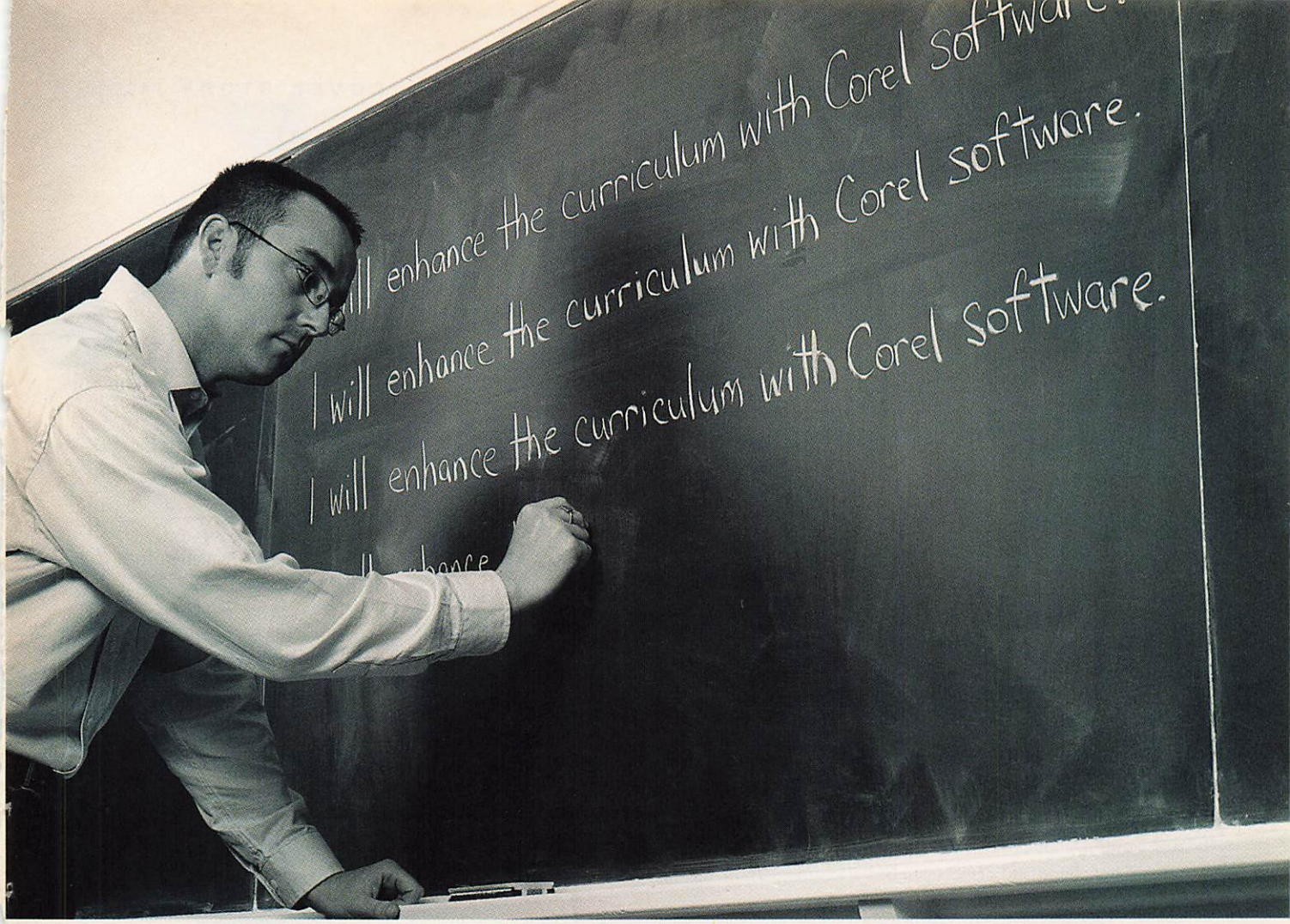
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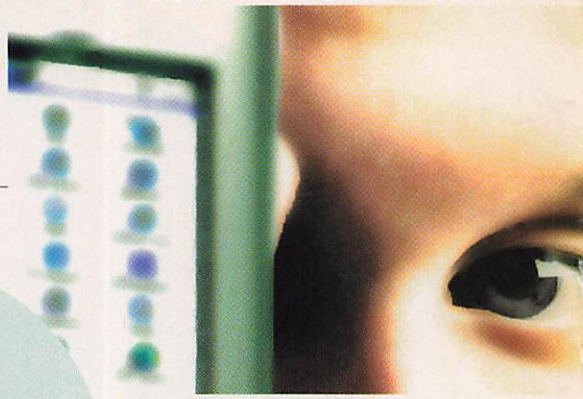

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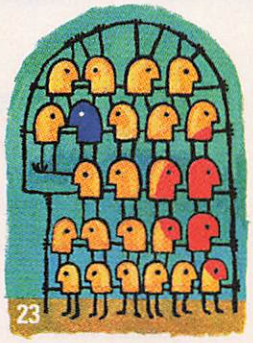
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Briefs

- Stanford Law School launched the **Center for E-Commerce,** a forum to explore electronic commerce law. Faculty of the Center will collaborate on interdisciplinary research and policy making.

- The National Science Foundation awarded the **National Center for Supercomputing Applications** $35 million to build the world's largest, fastest, distributed infrastructure for open scientific research.

- CyberStar, a subsidiary of aerospace firm Loral, will supply the **University of San Martin,** in Bogotá, Colombia, a pan-regional network integrates broadband Internet, videoconferencing, and telephony for campuses throughout South America.

For these and other news stories, or to subscribe to the weekly Syllabus e-News, Resources, and Trends, visit www.syllabus.com.

Smart Classrooms, Dumb Decisions?

Our campus teaching environments are changing, slowly. Students toting personal technologies from cell phones to laptops to Pads are invading the classroom. The rooms themselves now sport video projectors and at least podium connections to the campus network. In the heydays of the turn of the century—the 21st century—many campuses implemented port-per-seat systems. We're now putting more and more technology into our classrooms, hoping it makes the learning experience more effective and the teaching options more flexible.

What are the implications for us today? Are we better off now than we were four or more years ago? The truth seems to be we don't know—and that's too bad. In particular, the question is what are the teaching and learning outcomes that can be achieved when physical meeting spaces—classrooms—are augmented with technology? This may seem like a question from the mid-1990s when we were debating whether we should invest in expensive, dim, noisy video projectors or leverage our overhead transparency projectors with an LCD panel to make the computer screen visible to our students. After all, we already had the light source and optics from the overhead and that wasn't going away.

It soon became clear that the optical quality of LCD panels was nowhere near that which video projectors could achieve, and the price differences narrowed. It became obvious that we needed computer projectors in classrooms, but in every one? They are still relatively expensive, both in acquisition cost as well as maintenance (bulb replacement budgets are not trivial). Sharing expensive resources is often done in classrooms using the Just-in-Time medial cart delivery system. Of course that often translates into Usually-a-Bit-Late delivery wasting unrecoverable minutes of the Already-Too-Short 50-minute class.

We're in a transition period. I suppose that means we're alive since the fact is that we're always in a period of transition. To plan and act otherwise is to either embrace Luddism or to deny reality. However, in this case we're moving from the notion that being able to see a computer-generated image in a group is an extra benefit of occasional value, to the notion that it is an essential element of today's instructional toolset. It is very similar to the arguments in the past about the introduction of other new technologies. You've heard similar assertions. For example, "I think there is a world market for maybe five computers." This is attributed to Thomas J. Watson (1943). Or, "640K ought to be enough for anybody," a prediction of Bill Gates in 1981. You can imagine others; "Do we really need more than one network jack per building?"

Today we've broken the technology enhancements installed in classrooms into levels, often from one to four (or five). Level one classrooms are very basic. Level four classrooms are marvels of technology-transformed spaces. What's in a basic "level one" classroom? These are usually pre-computer, technology-enhanced teaching rooms with a videotape/DVD player, TV set, screen, slide projector and overhead projector.

The next level up (level two) is a room that

Illustration by Robin Jareaux

supports plug-in and display computer images, either from a podium computer or a laptop. Typically they'll sport an audio amplifier and various audio input sources, CD player, videotape/DVD player, video/data projector, recessed media panel and lectern, large screen, and a slide projector and overhead projector. Controls for these are often placed on the podium, or hidden on a wall somewhere near the front of the room.

Level three classrooms begin to merge with computer labs in that they offer computer resources at students' seats, in the form of a computer or port for a laptop that was brought to class. They often support the ability to display student computers on a large screen and send a selected image to all student computers. Of course each level up adds on to the technology baseline, so these will also have a videotape player, video/data projector, recessed media panel and lectern, slide projector and overhead projector.

Finally, level four classrooms are mini-TV studios. They support origination as well as display of two-way video conferencing. They have TV cameras (usually more than one, often mounted with robotic drives to either follow the instructor around the front of the classroom, switch to a pre-set visual field, or both), microphones, and a codec for video compression, plus the stuff described in the prior levels.

You may argue whether there is a need for the multimedia input sources (video tape players, CD players, DVD and audio inputs) and multiple display devices (TVs, video/computer projectors, slide projectors and overhead projectors). However, the basic classroom of today is probably some subset of the level two classroom. The cost of installed classroom technology is becoming less than the cost of supporting a human-resource-intensive cart-delivery system.

The challenge is that classrooms are still conceived and executed with technology considered as an add-on. We've slowly gotten to the point where networks are beginning to get consideration during a building design or retrofit planning. But the tools faculty need to teach with are not and should not be considered afterthoughts. They directly affect the construction or renovation of the spaces. They are the reason the building or room is being built in the first place.

This is all very confusing to the people responsible for campus facilities because the life expectancy for things that have become core elements of a teaching space in the classroom have replacement cycles approximating consumer electronics. That used to differentiate equipment put into a classroom from capital construction of the space itself. Things have been turned upside down.

One response to this is the idea of building classrooms as theatres—reconfigurable spaces that provide flexibility for the "performances" that will be staged within them. Good teaching is often theatre and the attributes of such spaces —lighting grids and power in the ceiling, as well as networking in the floor and walls and flexible layouts—are elements needed in today's teaching spaces.

Core technologies for teaching are going to be integrated into our classrooms. But that integration must be componentized, serviceable, replaceable, and consistent. Students will increasingly bring their own technologies into these spaces as they must work there. The challenges are great, but the smart part of the classroom should be in our approach to the solution and not solely in the equipment we install.

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Building the 21st Century School http://archive.ncsa.uiuc.edu/idt/index.html

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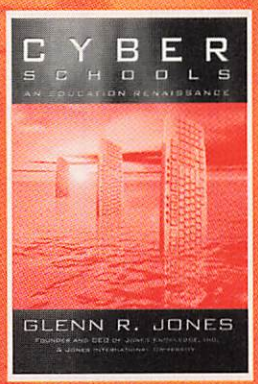

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Handheld Devices

Toward a More Mobile Campus

Personal computing is on the move—if slowly—from the desktop to a more mobile environment. Handheld devices, connected wirelessly to the campus network, will certainly change the way we work and communicate. But how soon, and when? Here, Mary Fallon offers an overview of the acceptance and use of handheld devices on campus.

By Mary A. C. Fallon

Most of the nation's 3,913 accredited colleges and universities haven't launched initiatives that recommend or require students to use handheld computers. Yet hundreds are experimenting with how to enhance learning with the mobile devices—hoping to leverage the coming convergence of wireless networks, Web services, and enterprise applications. Some pilot projects, like those at Western Carolina University in North Carolina and Loyola College in Maryland, are sputtering for lack of funds, or because they aren't central to the college's technology strategy yet.

Small Devices, Growing Status

"Handhelds haven't hit mainstream yet," says Mike Lorion, vice president of education for Palm Inc. "They are still building momentum. Mainstream is a couple of years away." Palm, which has garnered the lion's share of handheld sales to college students, faculty, and institutions, estimates sales to higher education climbed 10 to

15 percent over last year despite a slow economy. Lorion and a host of educators say that Palm's persistent financial difficulties don't seem to be having a negative effect on college sales.

While handheld initiatives on college campuses percolate, educators and IT experts debate whether handhelds will supplement or supplant laptop computers. Meanwhile, looming on the horizon are new types of portable computers based on Microsoft's Tablet PC software that could shove laptops and handhelds aside, or at least give schools more choices. The first tablets, which can be written on like paper, are being introduced this month by Hewlett-Packard Co., followed by Acer, NEC, Legend, and Toshiba. As an alternative, AlphaSmart Inc. licensed the Palm operating system and in June introduced a mobile computer called Dana, that has a screen 3.5 times larger than a handheld screen and a full-size keyboard. The Dana costs about two-thirds less than a typical laptop.

Access is the Issue

IT experts anticipate the array of computing form factors won't be the driving issue; instead the focus will be on how the range of computing and telephony devices can share and distribute content and services anytime, anywhere.

"All the stakeholders have to acknowledge that everyone wants access to resources in new ways," says Gil Gonzales, chief information officer for California State University at Monterey, which has a campuswide wireless network. "Universities need to repackage their content and services for a growing number of end-node devices—personal digital assistants (PDAs), tablets, and embedded devices designed for single tasks."

Kendall Whitehouse, director of Advanced Technology Development for The Wharton School of the University of Pennsylvania—where Palm handhelds are as commonplace as telephones—is convinced that the most effective strategy is to create a single universe of information that can be viewed from different size windows, depending on which type of computer is accessing it.

For many universities, re-creating all of the institution's information to be viewable via a Web browser that can be used by any type of computing device could prove to be an expensive and daunting assignment. Equally as challenging as that great leap forward in information access, is translating anytime, anywhere access into exemplary pedagogy.

CSU Monterey has teamed up with Western Michigan University and received two grants to develop a business plan for a wireless institute to study how technologies are used, and to do applied research on how wireless access changes learning and teaching. They expect new faculty projects launched this fall will yield some answers by June.

Applications—Present and Future

College educators can expect to be challenged by the paucity of academic software applications and e-textbooks for handhelds, the lack of professional development training on integrating handheld computers and wireless access into instruction, and the snail pace of providers of course management software to enable handheld computer access to their products' learning tools.

"There has not been enough software written for academic purposes, and you can't rely on faculty to create robust, enterprisewide applications for handhelds," says Ray Dannenhoffer, assistant dean for support services and director of medical computing at the University of Buffalo's School of Medicine.

For the most part, colleges with handheld initiatives rely on basic productivity software such as word processors, spreadsheets, and calculators, and the ability of handhelds to view specially formatted Adode Acrobat Reader PDF files and a smattering of

e-Books.

But there are some faculty who are exploiting the key attributes of handhelds to engage students in new ways and to assess their students' understanding of subjects.

Physics professor William F. Junkin, of Erskine College in South Carolina modified an application called Beyond Question for Palm handhelds. The student-response software works in combination with WebTarget Access Point, a new wireless technology from TriBeam Technologies that extends the communication range of the Palm handheld's infrared ports to 50 feet. The Beyond Question modification allows Junkin to electronically poll a classroom of students using Palm handhelds and see their responses displayed on his desktop computer in the classroom.

"Because I receive immediate feedback, I can determine my students' level of understanding at any point in time," Junkin says. "This free flow of communication keeps students involved, thinking analytically about the material, and more inclined to discuss their ideas."

Because WebTarget supports multiple users with bi-directional wireless communication, Junkin can gauge how well students understand a lesson by sending a set of multiple-choice questions to their Palm handhelds, receiving their answers within a second or two, and viewing their responses several different ways.

Junkin can view answers as they correspond to a seating chart, as answers from a work group, as an anonymous histogram that shows how many students choose a particular answer, or as a spreadsheet that lets him quickly spot which students are having difficulty and which ones are ahead of their

The First Wave: Mobile Medicine

The first discipline to integrate handheld computers is the field of medicine. Handhelds are as common as stethoscopes at dozens of U.S. medical schools today. Physicians and student doctors alike are quickly embracing this mobile, wireless technology to keep pace with their always-on-the-go work mode and the deluge of new information that informs their daily practice.

Medical schools are leading the way in the deployment of handheld computers and wireless technologies to monitor student performance, enhance student-educator communication, improve course management, and ensure that students have the latest information as they move between classrooms, hospitals, libraries, and clinics throughout their communities.

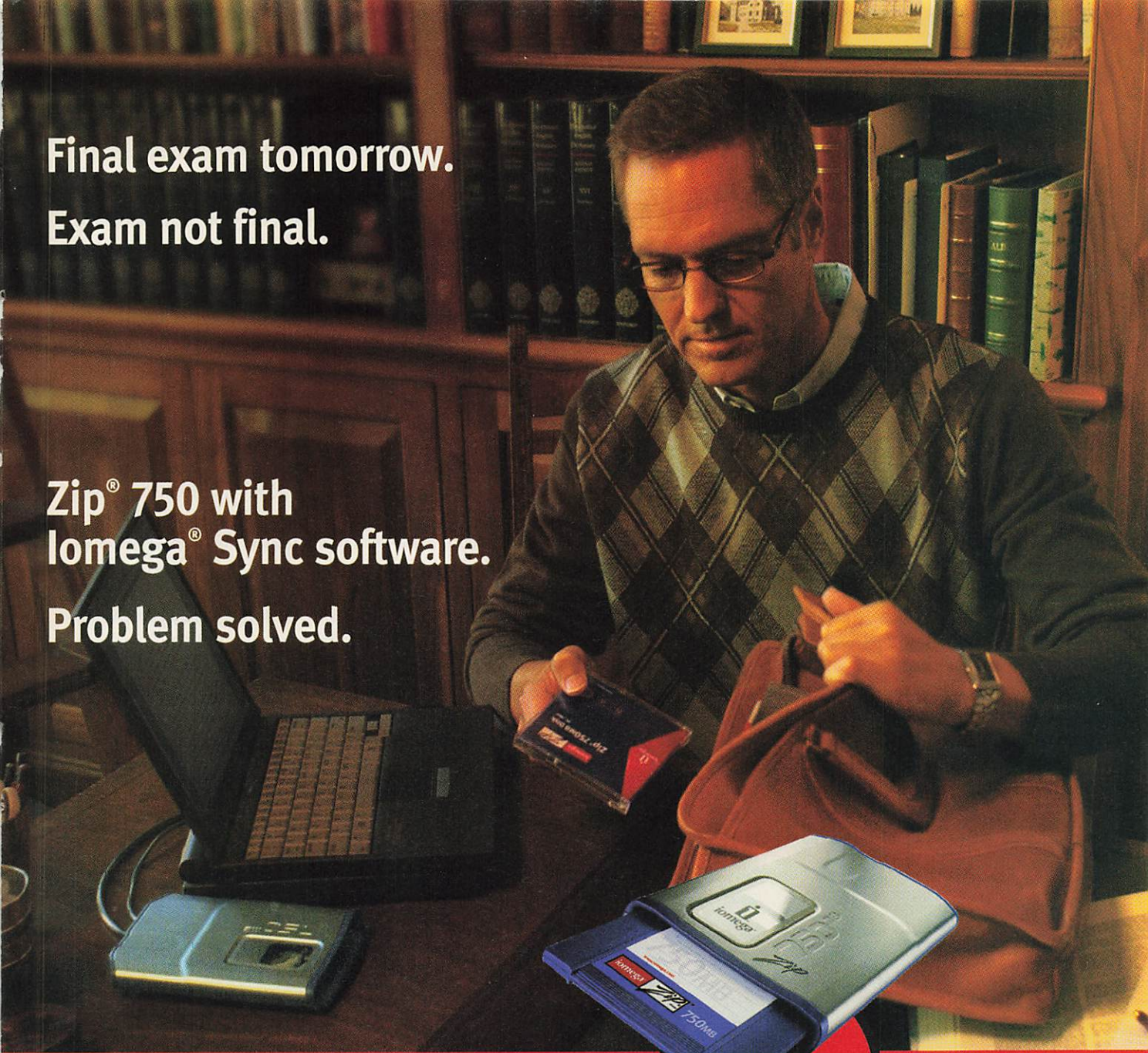
About one-fifth of the country's 125 medical colleges require their third- and fourth-year medical students to use handheld computers. Even at medical, dental, and nursing colleges that don't require handhelds, large numbers of students own personal digital assistants (PDAs).

At the University of Buffalo, the largest concentration of handheld devices can be found in the medical school. "Handhelds, with their instant-on ability, are a natural for the medical professions. With them you can provide more-informed patient care right at the patient's bedside," says Ray Dannenhoffer, assistant dean for support services and director of medical computing at the University of Buffalo's School of Medicine and BioMedical Sciences.

Handheld computing at the University of Louisville School of Medicine

In August, the University of Louisville School of Medicine became the first medical school to provide all of its 594 medical students with the mobile devices (Palm m500s). "We want to ensure that our students graduate with the skills they will need to practice medicine in the 21st century," says Ruth Greenberg, director of health sciences academic programming for the University of Louisville. "We believe that many of those skills require technological familiarity. By the time our students graduate medical school, using a PDA should be second nature to them. For the most part, I don't believe having medical students using PDAs will change how students learn the practice of medicine. At the same time, however, I do believe the PDA is changing, and will continue to change, the way physicians practice medicine."

Today, physicians use handheld computers to write accurate prescriptions, monitor critical information such as vital signs and medication at the point of patient care or from outside the hospital or their offices, track patient care, calculate a variety of health indices, and access reference materials such as pharmacopoeias that explain drug interactions. Some medical textbooks have been converted into e-Books readable by some handheld computers. Many of the medical colleges requiring students to use handheld computers are creating customized applications to track patient care.



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classmates.

"I can immediately determine if a single student or the entire class understands the lesson," Junkin says. "When this [anonymous histogram] view is displayed for the class to see, students know if others share their views. Their commitment to an answer increases their desire to participate in the discussion, but no one is embarrassed by the anonymous display of the responses."

In a similar fashion, business professor Don Sower of the University of North Carolina at Greensboro relies on a Palm handheld computer customized with LearnTrac classroom management software from eLearning Dynamics. The wireless application gives him the means to get student feedback during class much like television networks and public opinion experts analyze live audience responses.

Polling with handheld computers "has broadened the discussion participation in my classes," says Sowers. "People have had a chance to see how their ideas are shared by their colleagues, and they gain confidence from that."

"Technology is not going to replace the relationship between student and teacher, it's going to multiply it," says Robert Harris, president of Paradigm Research, which recently produced a white paper on LearnTrac.

Going into the second year of a handheld initiative that requires all first-year undergraduate, law, and medical students to buy Palm handhelds, University of South Dakota CIO Roberta Amber echoes that sentiment. She reports that USD educators have experienced an increase in the interactions between students and faculty, greater student participation in classroom discussions, and students developing better organizational skills.

As always, issues bubble around support and training. Preparing this summer for the second year of its handheld initiative, the University of Minnesota Duluth found it necessary to invest $50,000 to train computer science and engineering faculty on how to better use their HP iPAQ Pocket PCs as teaching tools, and to create software applications to fill the void, reports James P. Riehl, dean of the College of Science and Engineering and professor of chemistry at the University of Minnesota Duluth. "You have to invest money in faculty development if you want to incorporate handhelds in a meaningful, pedagogical way," Riehl says.

Some of the software void could be filled by course management providers. They are inching toward making their applications easily readable and accessible by handhelds.

Chris Vento, chief technology officer for WebCT, believes handhelds "...have potential—in the next one to two years you'll see much more traction with handhelds, but it won't be ubiquitous for about five years." With that perspective, Vento isn't rushing WebCT into making its products handheld accessible by tackling the basic functions like calendering and e-mail. Instead, WebCT is trying to determine what applications and level of access will differentiate them from competitors while maintaining a focus on enhancing teaching, learning, and assessment. WebCT expects that its first handheld-specific "learning tools," such as quizzes and polling, will be introduced this summer.

Selected Handhelds for Education

Product, Company	Connectivity	Memory	Processor	Weight	Battery	Wireless Capabilities
iPAQ Pocket PC H3970 model, Hewlett-Packard	USB cradle, consumer IR and IrDA (115Kbps) and integrated Bluetooth	64 MB RAM, 48 MB ROM	400 MHz Intel PXA250 Application Processor	6.5 oz	1400 mAh lithium polymer	Integrated Bluetooth, requires an attachment for 802.11b
Palm i750, Palm	USB cradle, slot for Bluetooth card, infrared beaming	8 MB RAM, 4 MB ROM, Palm OS Version 4.1	Motorola Dragonball VZ 33 Processor	5.9 oz	Rechargeable lithium polymer—one week power normal use	Via Palm.Net service, built-in antenna, always-on wireless network support within coverage area; slot for Bluetooth card
Treo 90, Handspring	USB cradle, infrared beaming, slot for Bluetooth card	16 MB, Palm OS 4.1	33 MHz	4 oz.	Rechargeable lithium ion, built-in, 10 days life normal use	Slot for Bluetooth card
BE-300 Cassiopeia PocketManager, Casio	USB cradle, optional modem kit	16 MB (8 MB program memory), 16 MB RAM	NEC VR4131, 166 MHz, 280 MIPS (64 bit CPU)	6 oz.	Rechargeable lithium ion, About 1 week of normal use	Slot for Bluetooth and network cards
Clie PEG-SJ-30, Sony	USB (cable), infrared, memory stick media slot	16 MB (15 MB available)	4 MB ROM, Palm OS 4.1	4.9 oz.	Rechargeable lithium ion	No
Pocket PC E310, Toshiba	USB cradle or cable, slot for Bluetooth SD card	32 MB RAM, 32 MB CMOS Flash ROM	Intel StrongArm 206 MHz	4.9 oz.	Rechargeable Advanced Lithium ion	Slot for Bluetooth card

Wireless Technologies and Handheld Devices

The next wave of technological change is building momentum as campuswide wireless networks begin to proliferate. Many colleges are installing wireless access points to provide coverage in libraries or classrooms. And The Campus Computing Project's 2002 survey notes an increase in the number of institutions making wireless access available throughout the campus. The percentage of U.S. higher education institutions offering wireless access everywhere on campus via 802.11b, commonly known as WiFi, jumped from 2 percent in 2001 to 10 percent in 2002.

"There has been a big leap in wireless between last year and this year," says Kenneth C. Green, director of the Campus Computing Project and visiting scholar at Claremont Graduate University.

"While wireless local area networks (LANs) are in their infancy, and they have associated problems such as lack of ease of installation and configuration, security issues, and scalability issues, one can look ahead and see dramatic changes in bandwidth, price and ease of use over the next few years," according to Charles R. Bartel, director of operations, computing services for Carnegie Mellon University, and John . Meerts, director of information technology services for Wesleyan University, co-authors of a next-generation wireless presentation at the EDUCAUSE 2002 Evolving Technologies committee meeting this past October.

Wireless LANs don't have the capacity to address high-bandwidth demand applications, but they can handle applications such as e-mail, Web browsing, instant messaging, polling, and small file downloads. The ability of wireless networks to handle those applications is prompting colleges to encourage the use of handheld computers and to lobby manufacturers to produce handheld computers that take better advantage of the wireless network's capabilities. Currently, most handhelds require a special 802.11 sled or card to access the network, or a monthly access service fee much like a mobile phone.

Even if a campus is totally wireless, once faculty, administrators, and students step off campus, access disappears. One solution may be Bluetooth, considered a personal wireless network technology, that colleges such as East Carolina University, Wake Forest University and Carnegie Mellon, are exploring. The latest HP iPAQ Pocket PC has integrated Bluetooth and some Palm OS handhelds provide Bluetooth capabilities through a tiny card placed in the expansion slot.

"Not all learning happens on campus," reminds USD's Roberta Amber. "Bluetooth will let students and faculty go into the field and share documents and information and collaborate easily. Faculty are saying they need this type of mobility."

Handhelds are still a novelty for many of the 14.5 million U.S. college students. But because mobile, wireless technology has the potential to allow people to learn and collaborate anywhere and anytime, it is expected that during the next five years we will see a big change in the way students and educators interact—and how information and instruction are delivered via myriad handheld devices.

***Mary Fallon** is an independent industry analyst, with expertise in handheld computing.*

Othe atures	Web Site
Trans ctive, color liquid crystal display. Record button; 4 hot keys; side up/down buttons; navigation pad; includes software applications. Pen-and-touch interfa handwriting recognition, soft keyboard, character recognition, voice record, inking. Supports computers running Microsoft Windows OS. Not compa e with Macintosh computers. Supports MSN and AOL instant messaging; E-mail is end-to-end secured using DESX encryption. Audio speaker, microp ne, audio out jack (3.5mm Stereo).	www.hp.com
Transr ctive, monochrome liquid crystal display with backlight; 160 x 160 pixels. Pen-and-touch interface, Graffiti handwriting, soft keyboard, collapsible keyboa Built-in dual expansion via card slot and universal connector. Supports computers running Microsoft Windows OS and Macintosh computers; custon ble soft buttons, vibrating and LED alarms; includes software applications. Supports Microsoft Exchange, POP3, IMAP4 and SMTP and supports AOL Instant essenger service.	www.palm.com
Transfl ive, color STN liquid crystal display, backlit. Pen-and-touch interface, Graffiti handwriting, soft keyboard, built-in keyboard. Secure Digital/ MultiM ia Cards, phone drivers for connecting to compatible GSM phones. Supports computers running Windows 95, 98, Me, 2000, NT, XP and Mac OS 8.5 - 9.x with US port, built-in keyboard, removable protective flip lid, key lock. Supports Blazer Web browser, One-Touch Mail (POP3), Palm SMS messaging application.	www.handspring.com
320 x 2 pixel, 32,768 color STN. Pen-and-touch interface, soft keyboard. Type II CompactFlash card slot, expansion PC card slot. Based on Windows CE 3.0, no Macin n support. Supports Microsoft Exchange. Stereo earphone jack.	www.casio.com
High re lution transflective color display, 320 x 320 pixels, displays 65K colors. Pen-and-touch interface, Graffiti handwriting, soft keyboard. Memory Stick expans slot. Jog Dial navigator, Supports Microsoft Windows 98SE, Millennium, 2000 Professional, XP Home Edition, XP Professional. Supports Micros Exchange, POP3, IMAP4 and SMTP.	www.sony.com
High resolution transflective color display 240 x 320 pixel, portrait resolution with 64K colors, front light fluorescent lamp. Pen-and-touch interface, soft keyboard. Secure Digital card slot. Microsoft Windows Pocket PC 2002 OS, plays MP3 music files and MPEG4 video files, navigation wheel.Supports MSN Messenger, Microsoft Outlook 2002.	www.toshiba.com

Implementing PDAs in a College Course

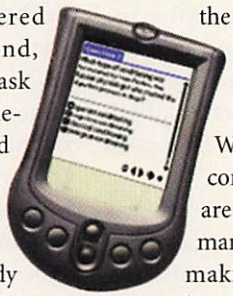
One Professor's Perspective

By Doug Peterson
UNIVERSITY OF SOUTH DAKOTA

Personal digital assistants (PDAs) have been a mainstay in the business world for several years, but their adoption in higher education is relatively recent. In the fall of 2001, the University of South Dakota became one of the first universities to implement a full-scale PDA program, giving faculty an opportunity to study how the devices can be integrated into college teaching and learning. Here, Doug Peterson shares his experience from the past year.

Underlying any attempt at integrating new technology should be a basic philosophy of the interplay between technology and education. When technology is used to support a task for which it is not well suited, failure is likely. The same is true when students are asked to use technology when it's not needed. Fortunately, both of these mistakes can be avoided by adopting the principles of "use-centered design" (Flach & Dominguez, 1995). Use-centered design replaces the traditional focus on either user or product with a concentration on the goals and tasks associated with the use of the technology.

There are two steps in applying a use-centered approach. First, learn the user's tasks; and second, consider the technology's capabilities. Ideally, the task analysis and technology reviews should remain independent of each other so as to avoid finding a need simply because the capability exists, or applying some capability just because you can. The purpose of the use-centered approach is to set objectives and then determine if they can be met by the technology. A study of PDA implementation at the University of South Dakota was done to determine how the PDA could replace traditional support materials and improve the completion of identified tasks.



Taking the PDA's Capabilities to Task

A student's primary objectives in most college courses are comprehending, retaining, and evaluating course material. Secondary supporting tasks include taking lecture notes, reading assigned materials, reviewing information to improve retention and comprehension, and completing exams and assignments properly and on time. A task analysis should identify the information necessary to complete the task, and with respect to a college course, most information comes in the form of paper or electronic text.

The PDA's strengths are flexible data handling, portability, and ease of use. Flexibility in data use is advantageous because tasks can be matched to the ideal data access format (e.g., information for the periodic table of elements can be accessed via a graphical interface instead of a text-formatted database). The portability of PDAs is an equally important attribute, because it increases the availability of the material contained within the PDA. (What instructor wouldn't want students to carry the syllabus and class notes with them at all times?) The PDA's ease of use is aided greatly by a consistent look and feel of applications.

Course Scheduling

One of the most important aspects of a course syllabus is the course schedule, indicating topics for each class period, exams scheduled, and assignment due dates. Support of this component corresponds perfectly to what PDAs were originally designed to accomplish. The problem to overcome is not how to put a course schedule in place (the calendar is the obvious solution), but instead how to make sure that the students will all have the right information on their handhelds. At USD this was done by creating a datebook archive file (in Palm Desktop) that students could download and import into their PDA. Once completed, the student's calendar contained all class meeting times, including a note identifying the topic and readings for each day. For exams and important events, alarms were pre-set to sound one or more days in advance.

Document Formats

Converting existing text-based course material (e.g., syllabi, laboratory instructions, term-paper guidelines, and the like) is the easiest of all PDA implementation problems for a course. The most difficult part is deciding which of the various available text formats to use.

The Palm doc format (unrelated to the MS Word format) is a good choice, because it is common, and PC and online document converters are freely available. The doc format can be read by many third-party readers but is not directly editable, making it desirable for materials that the student needs to read but not alter. Text editors are ideal for note-taking outlines or laboratory guides, where students may add additional information. Some are compatible with word processor formats on personal computers.

Adobe Acrobat files can also be converted for use on the PDA and offer better preservation of formatting as well as good image handling (including larger images that can be magnified and scrolled for detail). Others such as iSilo also preserve complex formatting and images and can be used to capture HTML content. An alternative to reader-based documents is a format called "Web clipping," or PQA, for the PalmOS (version 4.0 and higher). PQA files are created from HTML (with WCAbuild, a free program available from Palm) and function as a stand-alone application where the user taps the icon from the main screen to launch the document. This format is ideal for documents that students need access to without additional help, such as a syllabus that explains how to use other course-related PDA applications and files.

Application Areas

The ever-growing number of applications available for the Palm is also an important consideration. However, finding the one education application you need for your course, among more than 13,000 available, can be challenging. Some courses may benefit from very specific applications such as a periodic table of the elements for chemistry classes; financial calculators for business; or even the game "Cooties" to teach the spread of disease. More general educational applications are also available.

Tracking Assignments

4.0Student (by Handmark) allows students to track assignments and due dates, and can integrate course information into the PIM function of the PDA. Instructors can set up course information in advance and beam it to the students. Students can track their performance in individual classes or

overall GPA simply by recording their scores on graded work. They can also use student management applications to estimate their grade based on hypothetical scenarios (e.g., what will my overall grade be if I get 84 percent on the final paper?).

Test Preparation and Quizzing

Reviewing practice tests was identified early on in the task analysis as something students do to prepare for exams. This task can also be supported by the PDA in a number of ways, however, free applications make this very easy. After the review of several available quizzing and trivia programs, two applications emerged as the current leaders in the area of PDA-based practice tests: QuizApp and Quizzler Pro. Both products can present multiple-choice questions or flash cards in either a random or fixed order.

Each product has some unique features as well, such as a timed quiz (Quizzler Pro), or a categorical breakdown of performance (QuizApp). Both are free to students and have minimal costs associated with the creation of quizzes (Quizzler uses a desktop application, while QuizApp uses an online converter—both options cost under $20). Quizzler allows free quiz creation using the notepad, which will appeal to students seeking practice tests for non-PDA classes. The PDA-based practice tests have been well received by students, and informal assessment suggests that this has a beneficial effect on test scores. The use of PDAs for actual in-class tests is also a possibility, through these and other products currently available.

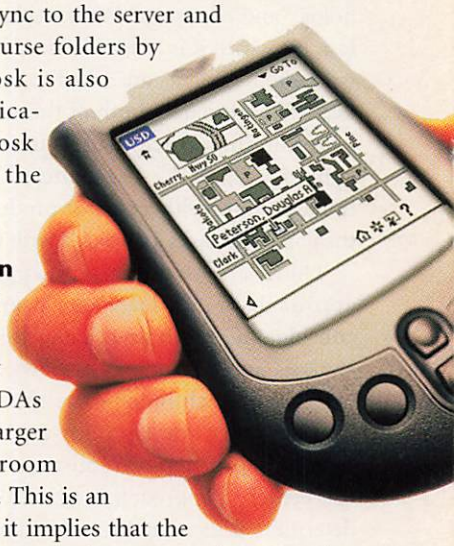
Custom Applications

Course-specific custom applications also have potential as the ability to develop them becomes easier and more affordable. An example of this is a speech evaluation program that mimics a course rubric for grading and allows students to beam their evaluations to the speaker for review. A second emerging PDA component which will impact custom applications in the future is wireless connectivity. Stanford already has a Bluetooth-equipped classroom that allows students to ask questions and respond to in-class surveys using their Bluetooth-enabled PDAs; faculty at USD are currently working to develop a similar but portable system for the spring 2003 semester.

In the Classroom and Around the Campus

PDAs may also play a role in general campus life. Students at USD can look up campus, faculty, or community information on a NearSpace powered data system. For campus locations, students can also link to the integrated campus map and find the building or room they are looking for.

The distribution of PDA material should also be considered. Sending individual files does not take long when using a "viral beam" (each recipient passes the file on to others). Downloading and installing from a PC is probably the most common, but other approaches are also available. USD students can access data and applications for their PDAs via two other options. IR Ports connected to an XTNDConnect server allow students to sync to the server and receive data placed in course folders by instructors. A PDA Kiosk is also available to install applications selected on the kiosk screen and beamed to the PDA via an IR port.



Technology Evaluation

The overall assessment of PDA applications in a large class reveals a few simple conclusions. PDAs appear to have a much larger role outside of the classroom than inside the classroom. This is an added advantage, because it implies that the technology does not supplant classroom education, but supports it. Obviously, this may change as wireless connectivity increases. There is also variability in the multiple PDA applications students liked and used. This variability suggests that with the proper evaluation of student needs, PDA-based support for a wide variety of courses can be implemented. Like all technologies, a PDA is only a tool; if used inappropriately it can be a source of frustration, but if used correctly it can be a tremendous asset. PDAs are likely to become an integral part of the educational landscape, so course instructors can either invest in utilizing them properly or hope that their students will.

Doug Peterson, Ph.D., *is an assistant professor of psychology at the University of South Dakota.* ***doupeter@usd.edu***

RESOURCES

Flach, J. M. & Dominguez, C. O. (1995). Use-centered design: Integrating the user, instrument, and goal. Ergonomics in Design, *3, 3, 19-24.*

4.0Student available from www.handmark.com (license required)

iSilo is available at www.isilo.com

NearSpace information available from www.nearspace.com

QuizApp Available at www.quizapp.com (free)

Quizzler Pro available at www.quizzlerpro.com (free)

WCABuild (to create PQA files) is available at www.palm.com

XTND Connect is a product of Extended Systems (www.xtndconnect.com)

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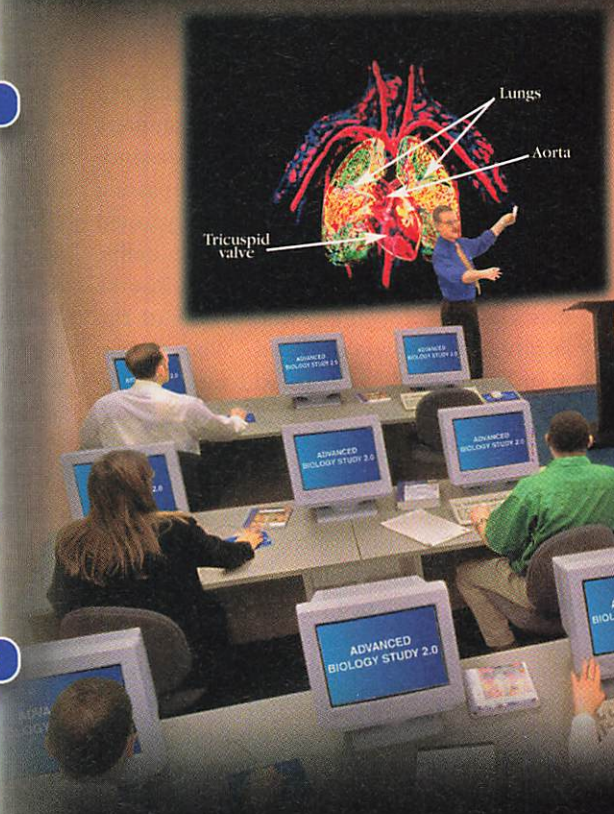

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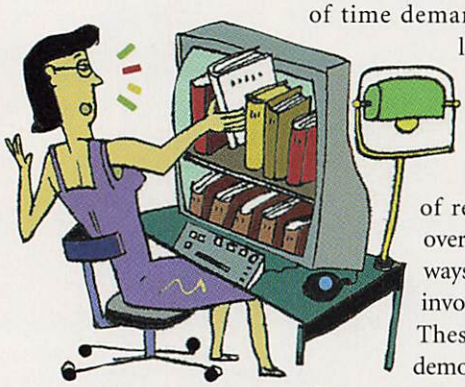
Sally M. Johnstone

As founding director of the Western Cooperative for Educational Telecommunications (WCET) at the Western Interstate Commission for Higher Education (WICHE), Sally Johnstone serves as a resource on higher education technology issues. She also serves on the Board of the American Association of Higher Education, the U.S. Open University's Board of Governors, and the Advisory Panel for the Consortium for the Advancement of Private Higher Education.
sjohnstone@wiche.edu

Why Share Online Course Materials?

Earlier this year, I had the opportunity to talk with a group of faculty members working with the Connecticut Distance Learning Consortium. I mentioned in passing my belief that in the coming years, faculty would be engaged less in developing their own online courses and instead would be using course materials developed elsewhere. One of the faculty members was confused. "What do you mean?" she asked. "How could I use someone else's material to teach my courses? How could those materials be relevant for my students? Why would I want to do that anyway?"

A few months later I was in Canada at Athabasca University, which was designed as a distance learning institution. Back in the 1970s their faculty developed printed-based distance learning materials and supported their students in a disaggregated manner through phone links. Now they use the Internet for the delivery and support of courses. They are finding this medium demands a great deal more time. One faculty member there asked, "What is being done at other places to help reduce the amount of time demanded of faculty using online learning resources?"



I think these sets of questions are related. Faculty need to learn to use each others' online course materials, instead of replicating the effort over and over again. There are many different ways this can be done. The simplest involves sharing "learning objects." These can be short animations or demonstrations of a particular point that an instructor wants to share with students. An example might be the actions of sodium and potassium in neuronal transmissions. Thanks to projects like MERLOT (www.merlot.org), these only need to be created once. Instructors can just direct their students to the demonstration.

There are more comprehensive ways to share materials as well. Whole courses can be shared. For example, the nursing faculty at the Community College of Denver was on a very tight schedule to mount a statewide eLearning program for potential nurses this past year. Given the scarcity of time and resources available to build this program, it made sense to look for opportunities to import parts of the curriculum. Rhonda Epper, who had worked on the MERLOT project as it was being developed, was able to find other institutions that were willing to share online nursing curricular materials. The institutions did not "officially" exchange courses, but the nursing faculty at the cooperating institutions allowed viewing privileges to one another's courses in an effort to accelerate the course development process.

This past summer, WCET staff surveyed a very unscientific sample of institutions throughout North America to get a sense of what was going on regarding course sharing. We found that several institutions across the country are using courses developed at other institutions. This is particularly the case in two situations. One is when there is a need to expand the number of courses rapidly in order to meet state mandates or student demand. The second is when expertise in a specialized subject area is not available at that campus.

If we consider the cuts to higher education budgets in many states, the rising demand for postsecondary educational services, as well as the average age of our current college and university faculty members, it makes sense to me that we will be seeing more and more cases of the second situation mentioned above. As more high-quality academic content comes online, it makes little sense to have every person who teaches students in an online environment produce their own materials. It may well be that my acquaintance in Connecticut who asked such telling questions is already looking over the course materials that MIT posted online in October for gems she can incorporate in the materials she shares with her students.

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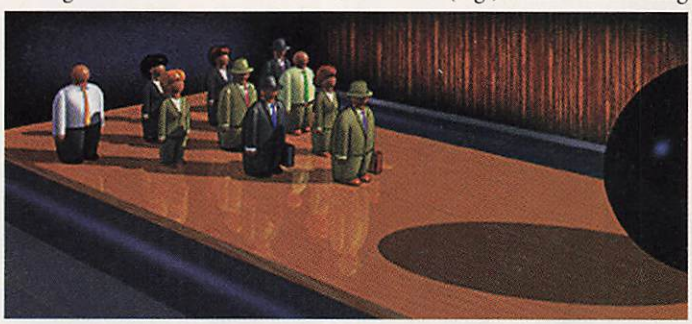
David G. Brown

David Brown is vice president and dean of the International Center for Computer Enhanced Learning. He has served as president of Transylvania University, chancellor of the University of North Carolina at Asheville, and chair of several national groups, including the AAHE and the Higher Education Colloquium. As provost of Wake Forest University, he founded the Annual Conference of Ubiquitous Computing Colleges and Universities, and founded the Journal of Computer Enhanced Learning.
brown@wfu.edu

Bowling Alone and Surfing Together

Robert Putnam, author of the book *Bowling Alone: The Collapse and Revival of American Community* (Simon & Schuster, 2000), believes that social capital and civic engagement increase when trustful relationships are built. The environment to build such relationships requires strong networks and reinforcing social norms. In their study of 374 Californians, Anita Blanchard and Tom Horan also found trustworthiness increased significantly when cyber communication is an addition to face-to-face relationships. Blanchard and Horan's results are less conclusive for cyber communities that are not also face-to-face (www.cgu.edu/inst/cguri/surfbowl.html).



This new research, in a new medium, takes me back to my own basic theory of effective teaching—the trust theory. Students grow most when they trust their environment. They must believe that their professors are up-to-date and care, recognize their university as a place of quality, find exemplars they wish to emulate, have available the books, journals, instrumentation, and Internet access appropriate for the time. The propensity of students to risk taking on new beliefs increases greatly when their mentors are experts who care. The educating objective of the university can best be fulfilled by creating an environment replete with trust.

In the computer we have a new tool to help us build trust. It is clearly not the only tool, but it is an important one. Many trust-building actions are simple and easy. Students can become impressed with the expertise of their professor by being guided to the scholar's Web site and reading about their publications. Students will interact with their classmates more meaningfully if they can "get to know them" through profiles and pictures posted on the class Web site. They can come to a deeper understanding of the relevance of their studies if the class Web site provides an opportunity to connect with practitioners in the field.

We can demonstrate that we care about individual differences (e.g., different learning styles) by providing multiple, redundant ways to learn the material. We can establish an aura of caring by sending three or four individual e-mails to each student during a typical semester. We can show respect for student capacities and knowledge by giving rigorous assignments, and asking students to make presentations to the entire class. We can help students come to trust each other by giving credit for helping colleague students, and by building in many team projects. We can demonstrate our respect for students by asking teams to create publicly accessible Web sites about the key concepts of the course. We can create an electronic journal of student papers. We can connect with students and professors working through similar materials at different universities, in different cultures. We can more quickly update our class materials and cite new information taken from the Internet that was not available when the textbook was published.

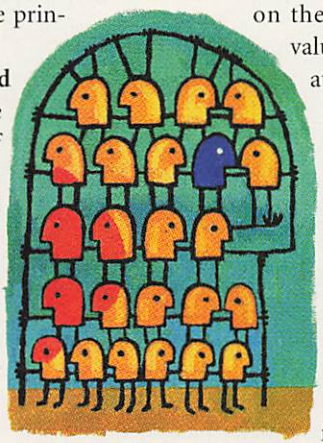
Each of us can wisely take the time to ask if there are still other things we can be doing to increase the sense of trust in everything we do. Reliable, consistent, individualized, and timely communication is the key.

Steven W. Gilbert

Steven Gilbert joined the American Association for Higher Education (AAHE) as Director, Technology Projects, in July 1993. He founded the TLT Group as the Teaching, Learning, and Technology Affiliate of AAHE in January 1998. He was previously vice president of EDUCOM, where he created and led the Educational Uses of Information Technology (EUIT) program and the EDUCOM Software Initiative (ESI). He also moderates the Internet listserv AAHESGIT.
gilbert@tltgroup.org

Connectedness and Self-Revelation

As forms of distance and online education become more widely used, pressure increases on educators to take advantage of the unique benefits of face-to-face interaction. Consequently, connectedness and self-revelation are becoming even more important. Certain approaches to instruction can be combined with appropriate uses of information technology to improve teaching and learning via the four principles of "personalizing pedagogy." Those principles are:



Variety in teaching and teachers. No learner can be equally adept at every kind of learning. And no teacher can be equally adept at every kind of teaching. Just as most learners can be served best by an individually tailored combination of materials and instruction, most faculty can teach best with a tailored combination of materials and strategies.

Connectedness. Building more connections, more personally meaningful communication between and among faculty and students, is usually possible and helpful for many kinds of teachers, teaching, learners, and learning.

Self-revelation. Revealing unique characteristics of oneself as a professional and a person is usually possible and helpful for many kinds of teachers, teaching, learners, and learning.

Technology. Technology, especially information technology, can be used to undermine or support each of the above—in order to personalize pedagogy.

However, valuable instruction can sometimes be quite impersonal and disconnected. Increasing the quantity and quality of the relationships between faculty and students is not necessary for every faculty member or student. Nor is revealing their individual characteristics. For example, a faculty member may have excellent skills at creating written materials to be used independently by students; and there may be students equipped with the motivation, self-discipline, and learning skills needed to make use of those materials. These faculty members and students may never see each other, meet each other, or even correspond with each other. While each is quite dependent on the other and the relationship is valuable to both, it is not personal at all.

When facing the almost overwhelming number of combinations of technology and pedagogy, remember that most education still involves both. That includes interaction between teacher and learner—most commonly face-to-face in a classroom—and independent work by students using materials carefully selected by the teacher—most commonly, parts of a textbook.

For the latter, especially in courses taken by large numbers of students, there may be resources and time available to reproduce those materials with as much skill and polish as a modern commercially published textbook. For some topics and learners, the invisible professionalism of the authors may be an asset. But that is not so if the goal is more in the direction of enhancing or replacing classroom discussion among people who are in the same place at the same time.

In contrast to giving faculty members the training and support needed to take on the characteristics of professional commentators or talk show hosts, a faculty member can acknowledge his or her own distinctive characteristics—voice quality, speech pattern, etc.—and use them to help learners distinguish this

continued on page 36

A New Lesson for eLearning Programs: E is for ent

By Evan T. Robinson
Shenandoah University

The recent state of the economy has led to some challenging times in higher education. The turbulence of the stock market coupled with challenges of student recruitment and increased competition have some colleges and universities actively seeking ways to increase revenue. Those programs with an online presence have the option of exploring untapped markets online. How much entrepreneurship should there be in eLearning?

While the idea of opening new programs might seem like taking your chances in an already up-and-down economy, consider that from June 2001 to June 2002 the S&P Index dropped 19 percent while the online programs tracked by the Chronicle Index of For-Profit Higher Education rose 16 percent. And today more people are going online. More homes have Internet access than ever before, with a potential growth area in home networks. Given these trends, there are benefits to be gained by taking some controlled risks.

Thinking Entrepreneurially

Entrepreneurship is not the same as throwing darts and hoping for the best. It is about planning and taking calculated risks based upon knowledge of the market, the available resources or products in a usable or close-to-usable form, and a pre-determined measure of the potential for success.

It would be financially risky for a program with no experience in online learning to suddenly decide there is money to be made and jump into the market with little planning or product. Conversely, established programs that can repurpose existing online materials to capture a small market segment as yet untapped can reap legitimate benefits. A specific example of this would be a program offering online degrees or degree completion to repurpose its content into smaller components in order to remediate students online for other colleges or universities. While this might not be a large financial gain, it provides increased revenue for minimal work, with nothing being developed from scratch.

Being entrepreneurial is about capitalizing on the strength or expertise of an organization and leveraging that to some gain. The gain usually is financial, although other advantages exist as well. Take the above example of a program that is remediating students online for other institutions. This could bring attention, research opportunities, and recognition to the entrepreneurial program due to its innovative applications of technology and online content that might previously have gone unnoticed. Thus the act of entrepreneurialism may lead to both direct and indirect benefits, neither of which would have occurred if the organization had not considered trying something outside of its normal business practices.

Another strategy is to consider new audiences outside of the original scope of the offering, such as using online materials developed for synchronous

instruction for one audience, and broadening the market to include others. For example, an online program for pharmacists could partner with a provider of continuing medical education to offer content to physicians as well.

As one might guess, these ideas suggest that outside-of-the-box thinking needs to take place, as opposed to the normal progression through the traditional academic model that can sometimes be slow to change. This means being risk willing as opposed to risk averse. While it is unwise to enter the eLearning marketplace recklessly, it is appropriate to be aggressive where warranted—and to not sit back and have a lengthy debate on what to do and how to do it. The "best of intentions" does not move the process any faster, and can cause an organization to miss a unique opportunity.

Measuring ROI

It is important to understand that being risk willing does not override being prudent, practical, and exercising common sense. For example, it might make sense to enter a new market in which your institution can capitalize on minimal competition and generate good, if not substantial proceeds. That way, the program is generating revenue that can be used for other purposes, and doing so via minimal changes to its existing eLearning content.

Something that might hamper program development is the amount of funds retained after the revenue is distributed across the university. Consider the example of a department generating roughly $50,000 in revenue via its entrepreneurial venture but then having to turn back a percentage or overhead of 30 percent to the central administration. Now, instead of $50,000 in revenue, the venture has generated only $35,000, out of which the operating expenses must still be covered.

In both of these examples, the potential bottom line could be small enough that the prudent decision would be not to create the work for such a small return on investment. That by no means suggests that supporting the campus collective should be avoided. On the contrary, each program is part of—and contributes to—the university community. But in some cases, the final numbers may simply not support the initiative.

Considerations for Entrepreneurial Initiatives

- Take chances when warranted and do not be risk averse
- Know the market before you act
- Plan first, act second, but definitely act
- Be prudent, practical, and use common sense
- Measure gains versus predetermined projections
- Utilize existing online resources for another purpose to minimize the work involved
- Think outside of the box and be creative
- Keep a portion of the revenue where the initiative began to generate future entrepreneurial spirit
- Realize that there are non-financial gains to entrepreneurial activities

Reaping the Benefits

First and foremost is the opportunity to raise alternative sources of revenue for departments or programs that might have otherwise settled for less than optimal budgets. While not every institution of higher education may be experiencing a tightening of the financial belt, it is safe to say that few colleges or universities would turn away from the chance to raise additional funds that are ready to use as they come in.

The challenge is that this revenue, if based on short-term contracts or episodic content sales, is difficult to plan into revenue projections. That in itself limits the usefulness of the funds generated, though there are some very good and useful ways the funds might be used. It is important to remember that the revenue should be used, to some degree, to benefit the personnel or program that put forth the time, the effort, and took the risk for an entrepreneurial venture. The rewards serve as an incentive for future entrepreneurial initiatives, both in that department and on other parts of campus once others see what took place. For example, the additional revenue could be used to supplement cuts to institution-sponsored research, faculty or graduate student travel, student help, or purchases of software or hardware. Another way to achieve this is to start the entrepreneurial venture with a particular goal in mind, such as software upgrades or a new server.

Taking the initiative and being entrepreneurial is not without some inherent risks, but if done with due consideration, then success should result. Taking a chance is truly only a chance if no thought or planning is involved.

Evan T. Robinson, Ph.D., is the director of the Division of Technology in Education at the Bernard J. Dunn School of Pharmacy at Shenandoah University. ***erobins2@su.edu***

Wireless 101 at Bellarmine; a unique approach to wireless access at Georgia; Delaware State settles for universal network; wedding video and distance learning at Washington State.

Bellarmine University

Wireless Networks: Planning for Success

Joy Hatch

For those of you who have lived through installation of a wired network, the thought of implementing a wireless network must seem like it would be fraught with peril. And, while it is true that the potential for problems does still exist, a careful approach to planning can greatly minimize—if not entirely eliminate—many hidden land mines that occupy the ground between you and successful installation.

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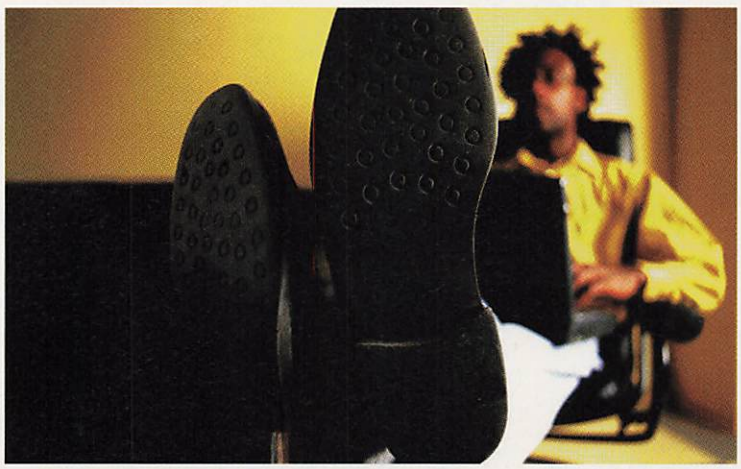


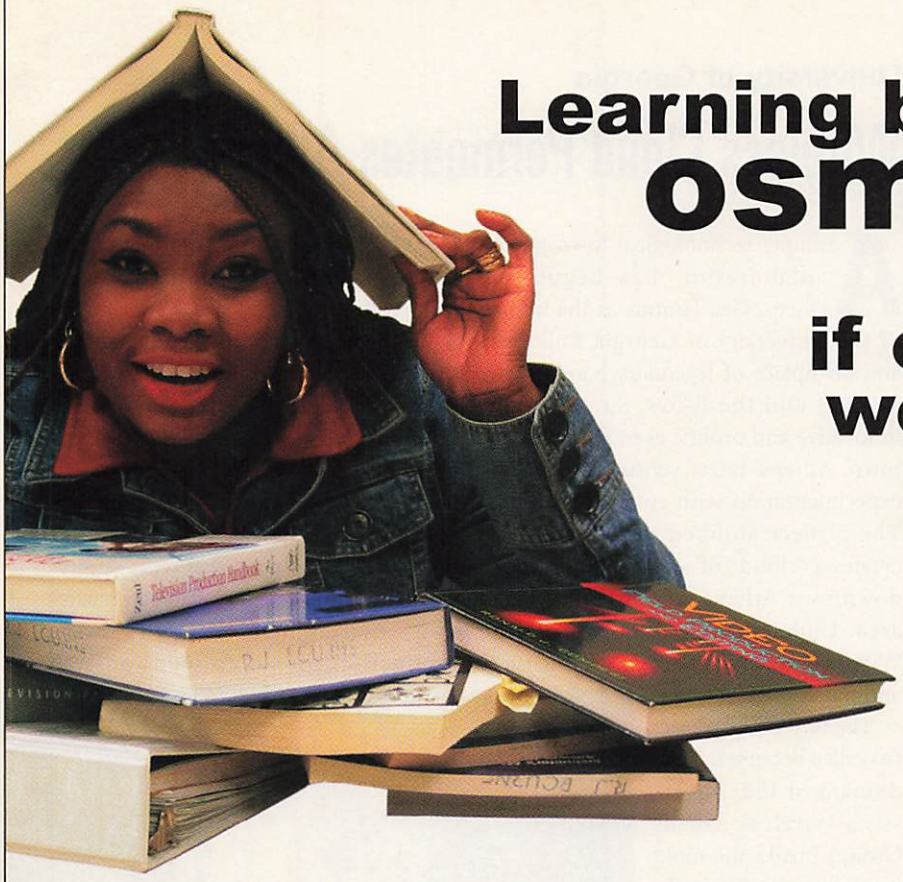
750 computers and 29 network servers with over 862GB storage. This handles an average of 350 users at any given time. We currently store 4,042 ID photos for 4,000 active UserIDs, as well as 4,542,341 e-mails online. Most of the buildings on Bellarmine's campus are relatively new—the University itself is only slightly over 50 years old. In the recent past, whenever a new building went up, a complete computer-friendly wiring structure went up with it. In some buildings, such as the W.L. Lyons Brown Library, every seat is wired with jacks for power and data as well as fiber-optic connections in some areas. In other buildings, however, wiring of any kind poses a major problem. For example, in the Kennedy-Newman residence halls, two of the campus' original buildings, the thick concrete floors and walls make insertion of even a wired network a nightmare. The solution? Wireless networks.

In some aspects, we like to think of ourselves as pioneers. The one self-image we do not want to consider, however, is of a person lying face down on the prairie with an arrow in his or her back. So we seldom jump into anything simply because it happens to be ultra-new or state-of-the-art. We always attempt to find a common middle ground between jumping right in and paralysis by analysis. The challenge posed by the Kennedy/Newman Residence Halls provided us with the perfect opportunity to test the concept of something we had long considered to be of tremendous potential value—wireless networks.

The Kennedy/Newman project was a first of its kind for Bellarmine, and posed many questions. What would it take to wire a building with thick concrete walls? How many unknowns would we find along the way? Once we got the system installed, would the students use the technology? What type of support were we going to provide? The only way to assure ourselves that we were heading down the right path was careful planning, taking each step in turn. Even with the planning, once the project began, the questions continued to grow!

Wireless is really becoming a consumer good. It is being sold to people for use in their homes, so there's not really much mystery to it. The downside risk, while it does exist, perhaps involves cost more than it does technical issues. Nonetheless, there is still a risk, so prudence dictates caution and due diligence, especially when choosing the technology to be used. For our first step, selecting the product, we wanted a product that met IEEE standards, had a good track record, and a company that provided technical support. After talking to vendors and testing different products, we settled on the Nortel eMobility suite of products.

The next step in our process was the site survey, which would determine the appropriate placement of the wireless access points. The results indicated we would need six access points on each floor, down a 200-foot hallway. With access points that carry coverage of almost 200 feet—this was almost unbelievable.



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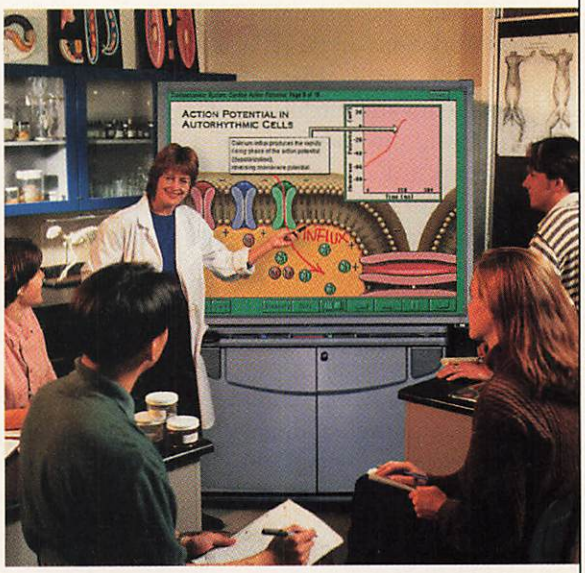

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However, Kennedy/Newman is one of the original buildings on campus, and is made of the type of walls that absorbs wireless signals. Without the site survey, we would have missed the mark on coverage for the building. Once we knew where to locate the access points, it was time for wiring. While it is true that end users need not plug their computing devices into a wired jack, there are nonetheless wires for IT and facility departments to contend with. With the location of each access point already determined, all that was needed was a network connection and electricity.

With the system installed and operational, the only thing left was encouraging the students to use the wireless network. Flyers announcing the new service were created and distributed to all students in the residence halls. Step-by-step installation instructions were placed on the Web. E-mail messages were sent to all residents advertising the service, and providing them the Web link. Help Desk personnel held "Wireless Workshops" in the residence halls to assist students in getting their connections setup and established. The extra work paid off—over one-third of the residents in Kennedy/Newman use the wireless network. Those not connected do not own a computer, or cite the cost of the wireless card as a problem.

The technical issues surrounding the installation of wireless networks include making the computing devices wireless-network-ready and making wireless coverage in the buildings sufficiently comprehensive. We must also ensure that our campus derives all of the benefits that wireless-network technology promises, and do all this within the constraints of time and budget. Each of these items must be considered, and if you do not incorporate thorough consideration of them all in your planning, those wires could wind up hanging you up, along with your hopes.

Joy Hatch is Director of Information Services Bellarmine University, Louisville, Ky. She can be reached at (502) 452-8301.

University of Georgia

Wireless Cloud Permeates Athens

A unique technological town-gown collaboration has begun in Athens, Ga., famous as the home of the University of Georgia Bulldogs and birthplace of legendary bands such as REM and the B-52s. Surprisingly innovative and prolific even for a college town, Athens' latest venture combines experimentation with entrepreneurism. The project, dubbed the WAGZone, creates a "cloud" of wireless access over downtown Athens, a 24-square-block area. Under this cloud, anyone with WiFi equipment can access the Internet and more.

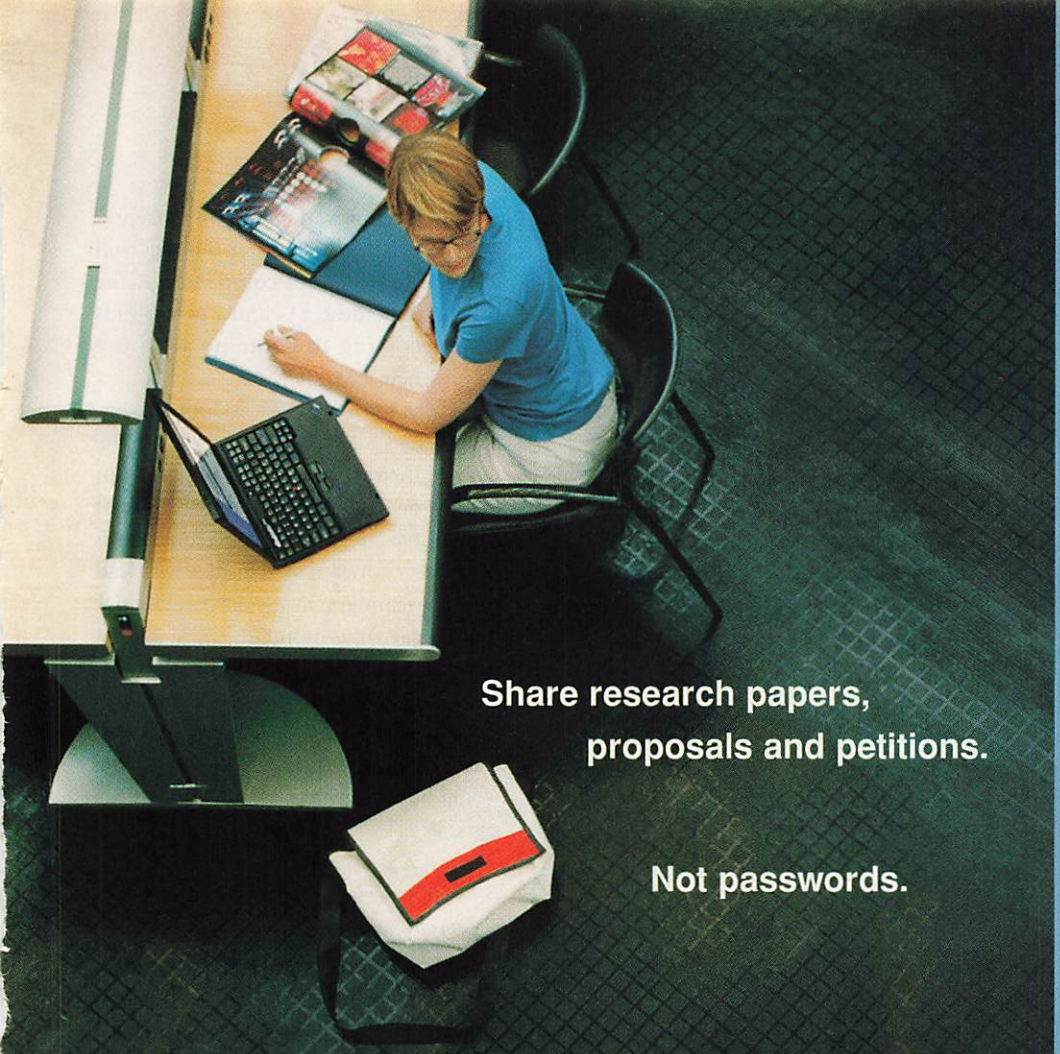
The WAGZone project (so called because it is the domain of the university's Wireless Athens Group) breaks the mold in many ways. Typically, universities fund the installation of wireless access points and other essential hardware to facilitate the use of wireless on campus. This may be an all-campus initiative or a series of individual access points installed by various users and departments. Until now, there hasn't been a lot of enthusiasm from universities to fund and manage wireless access for those beyond campus walls. What's more, universities that have installed wireless access have done so to enable constituents to access the Internet, campus portals, and specific projects. But the goals of the WAGZone are broader than Internet access.

Scott Shamp, director of the New Media Institute (NMI) at the University of Georgia, says the primary goals are research, development, and access. First, according to Shamp, WAG and NMI want to learn more about how people use and live with high-tech tools. "We want to explore the relationship that people might have with wireless technology," he says. "Information has always been a destination—people go to it when they want to learn something. Wireless technology offers the possibility that information can be a companion, something you take along with you."

To that end, every course offered with the New Media Institute this fall will ask students to interact with the WAGZone. A usability course will focus on designing interfaces for PDAs that will allow handheld users to make use of the WAGZone. Shamp's lecture course will break into 11 teams that will explore what types of services people would like available in a wireless environment. A rich media production course, to focus on Web casting and streaming, will examine how Athens businesses such as nightclubs might interact with the WAGZone. Students will interact extensively with the greater Athens community to find exciting new applications for wireless.

One outcome of the project could be an influx of innovative, wireless-content development companies to Athens, spurring economic growth. Says Shamp, "here in Athens we have talent and a reasonable cost of living. The WAGZone is an opportunity to showcase what someone might do here." Sharing that goal is the Georgia Research Alliance, a public/private partnership dedicated to improving Georgia's economy. The GRA contributed $75,000 to fund the WAGZone.

But economic development doesn't have to come from the outside. WAG wants the Zone to be a "sandbox" for ideas, a place where students and researchers can "build prototypes, experiment, and explore." There is an open-ended approach to the Zone that



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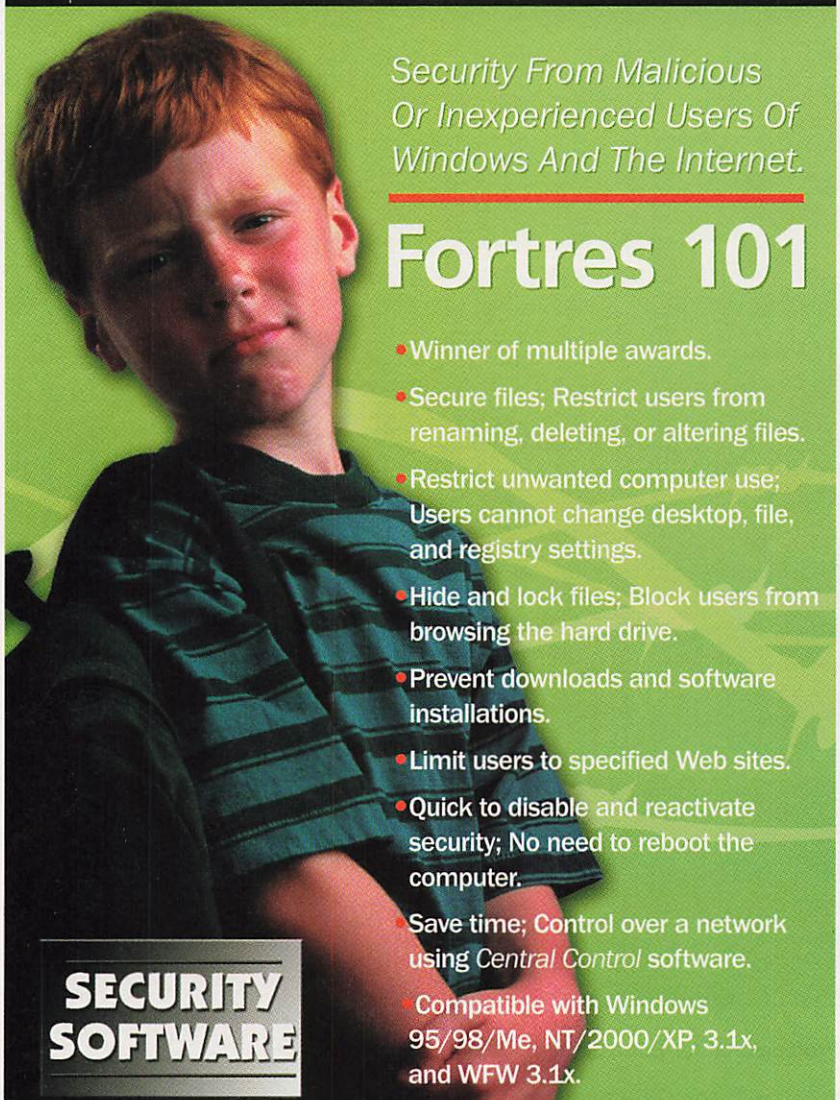
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encourages innovation and an entrepreneurial spirit, which Shamp hopes will lead to student-built companies. As he puts it, "It's these 21- and 22-year-olds who are going to come up with the exciting new ideas."

Finally, the WAGZone is about access. Shamp and his colleagues hope that the development of the cloud will prompt other wireless constituents to adopt compatible standards, establishing interoperability between systems that will lead to near-seamless access as wireless use increases. At the moment, UGA doesn't have a consistent wireless program in place, and wireless access on campus consists of a series of "scattered clouds." One potential benefit of the WAGZone would be the eventual closing of all those gaps.

For more information on the Wireless Athens Group, visit ***www.nmi.uga.edu/research/wag*** *or contact Dr. Scott Shamp at* ***sshamp@arches.uga.edu.***

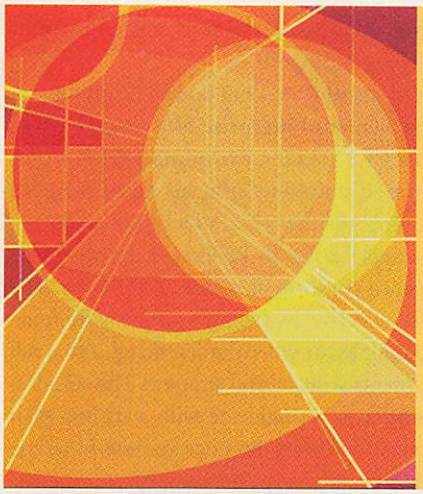
Delaware State University

One University—One Telecom Infrastructure

By Charles D. Fletcher Jr.

A university's commitment to students and education can be seen in its commitment to providing the technology necessary to fulfill its mission. Like many universities' mission statements, Delaware State University (DSU) aims to provide an education that emphasizes both the liberal and professional aspects of higher education. But unlike many universities, DSU has made the commitment to providing the necessary technology for its students, faculty and staff to succeed.

Driven by the vision of a voice and data converged campus, the University's Department of Information Technology



Without a focus on profitability, few universities operate with the cost-effectiveness of a business enterprise. More often than not, academic departments are left to their own devices.

has set its own mission to raise "the level of technology to its highest standard," reads the IT Department's mission statement. "It is our vision, that the future of communications at DSU empower the institution's thrust forward."

Without a focus on profitability, few universities operate with the cost-effectiveness of a business enterprise. More often than not, academic departments are left to their own devices in terms of operations. With their own budgets, for example, the biology department really has little incentive to link or share their technology solutions with the physics department. But at DSU a new vision of convergence and IT centralization has taken hold.

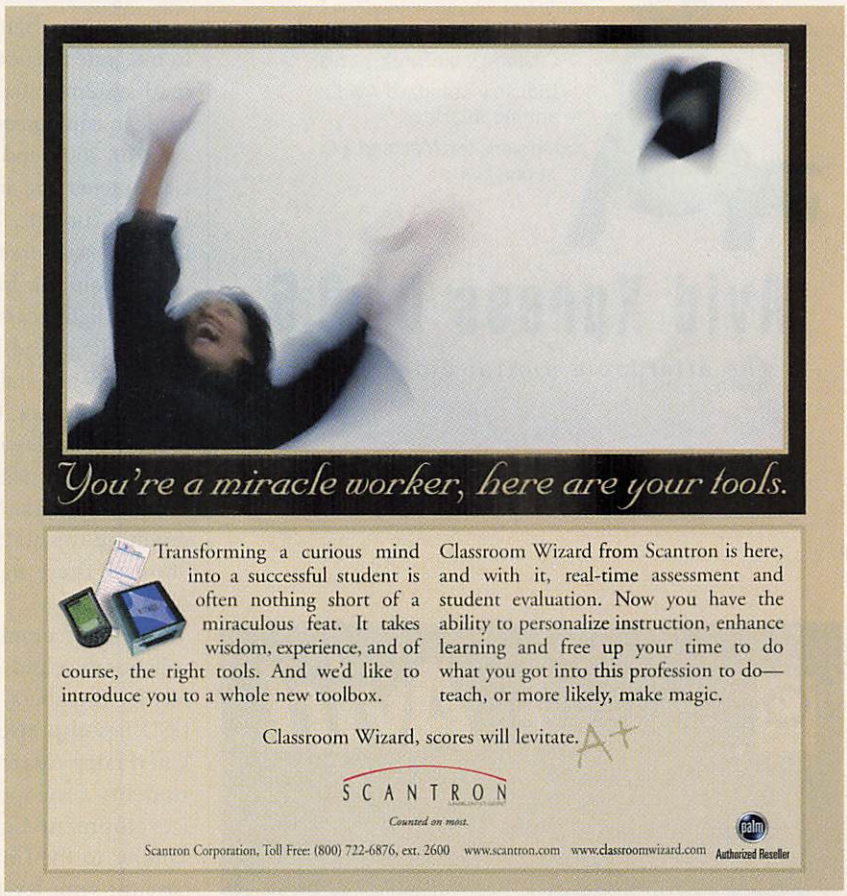
The DSU vision began to materialize in 1999, aimed at streamlining operations, fostering interdepartmental communications, enhancing learning opportunities for students, and gaining economies of scale when purchasing technology. In that year DSU was able to obtain Y2K funding from the state of Delaware, as well as Title III federal funding under a mandated program to support historically black colleges and universities.

For the first time in its more than 100-year history, DSU was able to develop a campuswide IT strategy. It set out to bring order from chaos, eliminating islands of technology and cost effectively leveraging technology as a universitywide resource. With this newfound dedication to providing advanced technology for students, faculty, and staff, DSU began work on its floundering telecommunications network.

Small as DSU was, it still had 16 different private branch exchange (PBX) systems operating independently that essentially could not communicate with each other. Some buildings had four-digit dialing to call the state capital building downtown, yet others could not use this feature to call someone in the next building on campus.

Having so many different systems contributed to a duplication of services that was both costly and inefficient. The problem was addressed in the Y2K planning period. DSU officials hoped to purchase a campuswide PBX and replace all small Centrex-based PBX systems. DSU wanted to provide a unified face to its existing IT infrastructure as well as improve the level of service it offered to faculty, staff and students. But as a public-assisted university, the solution had to be cost-effective, as well as efficient.

Beginning in 1999 and lasting six months, DSU officials planned and reviewed companies on the State of Delaware-approved vendor list for telecommunications systems. During this time, DSU administration used state funding in the Y2K budget to establish a CIO position titled Assistant Provost for Technology & Information Systems. This position would serve to centralize all current and future technology under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a single administrator and thus eliminate confusion that resulted from multiple functioning PBXs.

The University issued an RFP in 1999 and by September a contract was issued for Siemens Enterprise Networks to cover six buildings for a cost of $133,000, excluding wiring. After initial work on the project, university officials asked Siemens to expand its project to include the remainder of the campus.

The solution was to replace the 16 PBXs with one Siemens Hicom 300 IP convergence platform at a cost of $471,184. The new PBX delivers more effective switching, campuswide four-digit dialing, ISDN capabilities for video conferencing, and a call center that provides students with critical support. The solution connects the entire campus as a single site with a dialing plan that is the same for everyone. Even the once-remote welcome center is fully integrated with the rest of the campus.

The next stage in the Y2K technology vision started in the spring of 2001 with the construction of new campus-styled housing south of the main campus. To progress toward its goal of having a completely converged voice and data network, the DSU and Siemens team worked with University Courtyard to pilot a Voice over IP (VoIP) system for the 256 students in the complex. The University implemented a Siemens HiPath 5000 enterprise softswitch that provides both voice and data services to a new off-campus dormitory facility that will serve as a pilot project to prove the benefits of a converged, campuswide network.

Just as important, with the help of this vendor, DSU was able to integrate the new technology with their existing Octel voice-mail system, thus protecting the investment they'd already made in equipment. The VoIP system went into production on Aug. 10, 2001, and has been so successful that University officials entered into another contract for the University Courtyard Phase 2, currently under construction. This phase will provide the VoIP structure for an additional 156 students.

The solution has raised the level of communications on campus light years. Faculty and staff now enjoy easy conference calling. And having the entire campus wired also gives the faculty and staff the ability to work in a more mobile environment. Taking this idea one step further, DSU is implementing a teleworking solution that will allow faculty members to work remotely while still having access to the campus network. Not only will this help with recruiting and retaining top staff, but it could greatly reduce the need to "house" these new recruits, as well as existing staff, on campus.

The new communications infrastructure promotes a more collaborative and creative environment on campus, between faculty members, as well as between students and faculty. DSU has also extended this connectivity off-campus to the University Apartments, a unique residence unit of 280 students developed privately in partnership with Ambling Development Company LLC. DSU extended fiber from campus to the University Apartments so that students could have the same level of access to University services as do those

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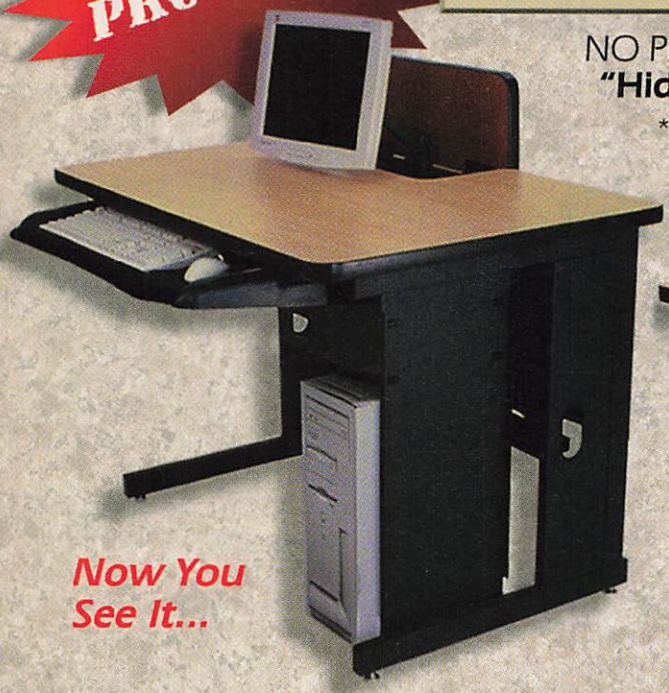

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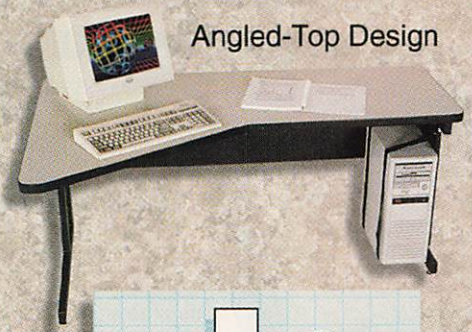

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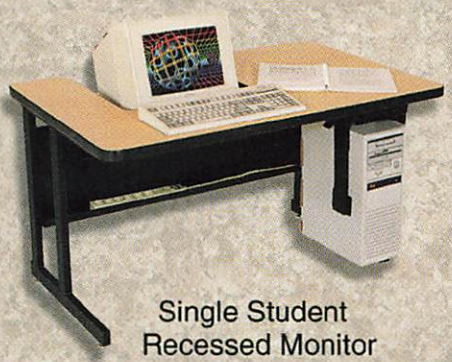

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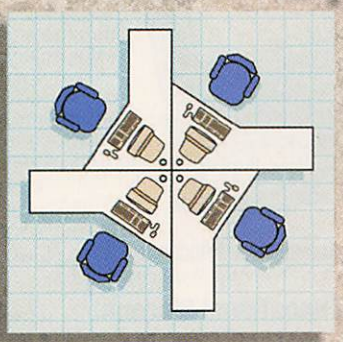

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These services now include the support of a contact center that allows the University's 15 call center agents to provide students with critical support for financial aid, admissions, registration and administration. In addition, reporting functions track both calls and expenses, which allows administrators to better analyze department cost expenditures.

The new telecommunications systems will provide a fine return on investment (ROI) for DSU. With the old Centrex system, the cost of leasing figured to be $15 per line, per month, bringing the total yearly cost to approximately $360,000. The new system is expected to have a complete system payback in just six years and eliminate the costs associated with the leased lines.

The new telecommunications network was not only a solid investment for the university, the multi-year project has clearly created the type of infrastructure required to provide a quality education for DSU's 3,350 students. The IT department at DSU has provided the kind of technology that, inline with the university vision, will "thrust" the school forward.

Charles D. Fletcher Jr. is assistant provost and chief information officer, Technology and Information Systems, for Delaware State University. For more information, contact him at ***fletcher@dsc.edu.***

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Video Bridging the Digital Divide

There are any number of reasons that prevent potential students in remote areas from relocating to pursue educational opportunities. Yet many of those students are willing to use advanced technology to further their education. In the 1980s, Washington State University (WSU) served this demand by creating a distance-learning network.

WSU's approach to distance learning relies on two separate networks, one that is IP-based, the other ISDN. WSU was one of the first universities in the country to create learning centers designed for communities so small that a branch campus was not feasible. In these communities, the university establishes a classroom linked to the main campus via videoconferencing and the Internet.

"Through the distance-learning networks and learning along with remote research and extension centers, Washington State University is able to offer 120 distance-learning classes per semester," says Randy Cross, multimedia specialist for the College of Agriculture and Home Economics and manager of the IP-based network. "We are one of the busiest distance-learning networks in the country."

The Washington Higher Education Telecommunications System

The Washington Higher Education Telecommunications System (WHETS) is the university's ISDN-based distance-learning network. Operational since 1987, WHETS links university classrooms electronically across the state to enable live, two-way video interaction for distance learning. Courses are offered among sites on a common schedule that coincides with courses taught on each campus. "Interactive video communications allows the university to offer a wider range of courses at all locations," says Cross.

WHETS currently serves more than 22 academic programs with about 110 courses per semester and 10,000 hours of instruction annually. The university is finalizing plans to allow access to and between similar systems in other states. In addition to delivering academic courses, the university community leverages the network for faculty and administrative meetings, student advising conferences, and staff development programs.

In total, WHETS supports more than 1,200 hours a year of videoconferences and meetings to support instruction, research, and public service. An additional high-speed data service uses the excess capacity of the digital transmission system to provide voice and data services between campuses. The WHETS network currently includes a mix of video communications end-points. Cross says the network, which includes Polycom's VS 4000 among its video technology, is moving rapidly to standardize on Polycom systems.

WHETS has served as a model for higher education institu-

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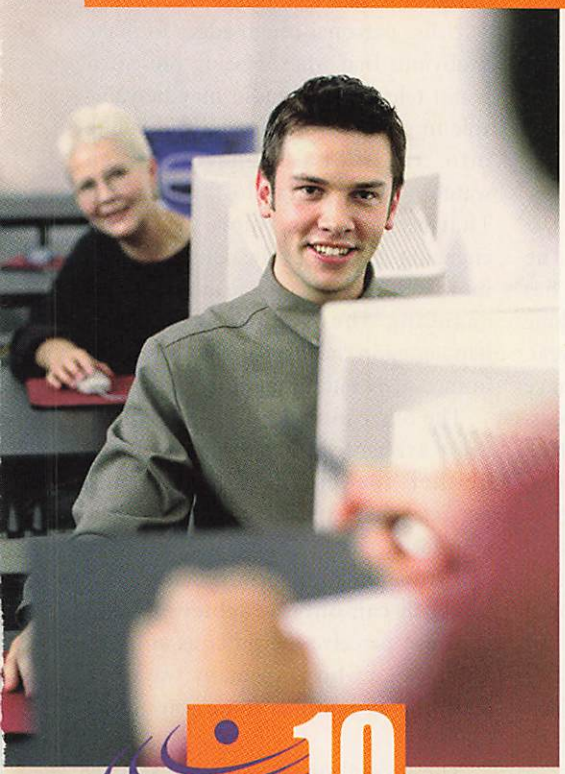

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tions, driving a proposal to expand it to all higher education campuses in the state, according to Cross.

The Washington Educational Conferencing Network

WSU's College of Agriculture and Home Economics represents 35 percent of the institution's total student population and hosts the university's IP-based distance-learning network—the Washington Educational Conferencing Network (WECN).

The university uses Polycom's ViewStation 128 group videoconferencing systems and its ViaVideo desktop video communications appliances to enable real-time, interactive communication between students and faculty. The systems allow participants to share documents through multimedia presentation tool support. Presenters can use an assortment of popular meeting tools including VCRs, document cameras, and white boards, and can leverage computer presentation programs such as Microsoft Power Point, Macromedia presentation programs, Web browsers, and other PC applications.

For connectivity, the WECN IP network relies on 768 connections on Internet2.

Moving Ahead

Cross measures the success of the network in terms of usage, and he has seen tremendous results. IP traffic alone has increased 500 percent over last year. "WSU faculty and students alike have embraced the networks," says Cross. "Students benefit from exposure to a broader array of faculty members, and faculty can share their knowledge with a larger and more diverse pool of students. All participants agree that the added diversity benefits classroom interaction."

For more information, contact Randy Cross at ***rcross@wsu.edu.***

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Technology Implementation,

continued from page 23

experience from commercial television or radio.

Using personal rough edges to make it obvious that what is being presented is not television or radio may be valuable in getting students to avoid falling into traditional behavior when watching or listening to those media. That means paying more attention, engaging more actively, demonstrating more respect, and not thinking about changing the station if what is happening in the last few minutes is not immediately interesting or useful.

The other major reason for taking a more translucent approach—hiding neither the media used, nor the personal characteristics of the teacher—is to foster connections between faculty and student. The motivational benefit for both can only be achieved when each can perceive the other as an individual, one who is in many ways like everyone else and in some ways quite unique.

The special qualities of the faculty member can be communicated in many ways. The intellectual ability of the faculty is reflected in the choice of instructional materials and the organization of the content.

It is healthy for both faculty and students to realize that being able to speak glibly and continuously over some sort of telecommunications medium is not an essential characteristic of thoughtful people, good teachers, or conscientious learners. But it is important to learn to communicate clearly in a variety of media for a variety of purposes. This includes the ability to let others hear and see enough of our personal characteristics to be recognized as unique individuals

I hope the increasing attractiveness of using new media and new technologies for telecommunications will encourage more faculty members to reveal more of themselves not only in these media but also in their face-to-face work. By doing so, faculty members can connect more frequently, deeply, and meaningfully with more of their students.

FEATURED PRODUCT

OpenOffice.org: An Open Alternative to Off-the-Shelf Suites

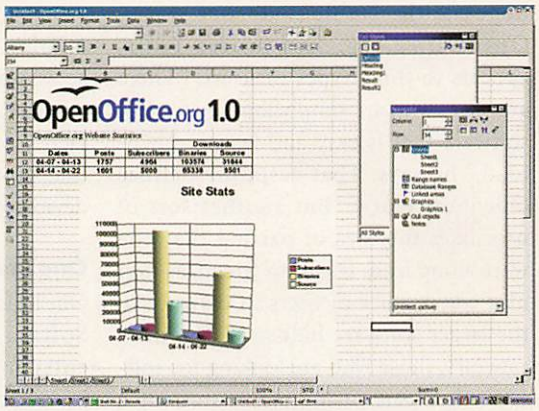
Open standards offer software users the opportunity to literally think outside the box—the box that holds commercial software disks, that is. The open-standards philosophy relies on the free dissemination of applications, code sharing, and a community of users who continuously contribute to improving the product.

OpenOffice.org is an open source office suite that features the same productivity tools as StarOffice and Microsoft Office. OpenOffice.org has a spreadsheet application, word processing, presentation manager, and drawing program. The user interface and feature set are remarkably similar to StarOffice and MS Office, although OpenOffice.org is not a duplicate of either. Some features vary among the three. The source code for OpenOffice.org comes from Sun, which owns StarOffice. OpenOffice.org runs stably and natively on Solaris, Linux (including PPC Linux), and Windows. Additional ports, such as FreeBSD, IRIX, and Mac OS X, are in various stages of completion, with the Mac OS X port likely to be available in a "complete" form early in 2003.

Users can print in PDF and other formats and save their work in various file formats. OpenOffice.org also has a working spell check function and online help. There are most of the same features as commercial products. OpenOffice.org works transparently with a variety of file formats, including Microsoft. However, it does not support the use of macros from legacy programs.

OpenOffice.org is free to any user who cares to download it from www.openoffice.org. However, at the moment it does not come with a manual, and there is no technical support available. For that reason, OpenOffice.org may be best used by those already familiar with similar office productivity suites, or those who enjoy working with open-source products that they can shape to their own purposes.

According to Josh Berkus, volunteer project lead for OpenOffice.org, third-party OpenOffice.org handbooks will be available within the next few months. "There are already 'quick reference sheets,'" says Berkus, which can be viewed at www.cluesheets.com. Also, developers have written online tutorials (see http://documentation.openoffice.org, www.ooodocs.org, and www.digitaldistribution.com).



OpenOffice.org: An open-source suite with the same tools as StarOffice and Microsoft Office.

Jerry Feldman, a software engineer at Hewlett-Packard Co. and a part-time Linux instructor at Northeastern University, said OpenOffice.org loads faster than StarOffice, which he has also used. Feldman uses OpenOffice.org for his in-class presentations. "The fonts are easier to manage in OpenOffice.org," he says. What's more, OpenOffice.org features have "saved me time and make my presentations easier to compose."

The only aspect Feldman misses about StarOffice 5.2 is its capacity to display two presentations side by side simultaneously. OpenOffice.org uses separate windows. But Feldman would not sacrifice OpenOffice.org's other features in order to get that back.

OpenOffice.org is best thought of as

both a product and a project, or perhaps a process. As with other open-standards products, this one is in a constant state of development, offering a high level of functionality even as it is being improved upon by dedicated users and fans. Louis Suarez-Potts, a community manager for OpenOffice.org, says one can best compare open-source software to commercial software by thinking of the differences between a movie and a still picture: Open-source software is dynamic, and what you see is changing all the time.

Commercial packages, with their dependable, stable code, are static. OpenOffice.org, says Suarez-Potts, appeals to three types of users. "There are users who are simply looking for free software that is easy and fast to download," he says. That certainly defines OpenOffice.org: "But another sort of user likes the idea of passing the software along from friend to friend, as part of a community of users in defiance of the larger software industry." The third category, those who are looking for software they can customize, represents a large number of OpenOffice.org's users.

Suarez-Potts, who is also a consultant and part of the team of paid and volunteer marketers for OpenOffice.org, thinks that both aspects have enticed new users to the suite. He points out that the software is truly international, already available in 27 languages with more in development. "It's an ideal product for parts of the world where commercial software is too expensive," he says. What's more, because the file format for OpenOffice.org is XML, interoperability is easy. It is accessible and adaptable by anyone. XML file format also incorporates zip compression, so that files saved in it can be made 25 percent to 60 percent smaller. XML support also allows users to save files to PDAs and other portable devices.

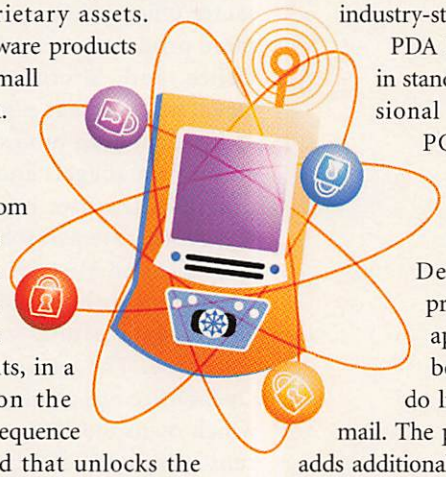
For more information about OpenOffice.org, visit www.openoffice.org.

TECHNOLOGY ROUND-UP

Is Your PDA Secure?

We hear a lot of talk—and see a lot of products—designed to protect laptops, desktops, and networks from theft and security breaches. But what about personal digital assistants (PDAs)? Not only are they completely portable and thus quite likely to be left behind somewhere, but they often contain confidential data.

Sure, they're relatively cheap to replace. But as with any computer, it's the information inside them that holds the real value. What's more, with their port and beaming capabilities, PDAs also serve as access points into users' desktop machines and all their proprietary assets. Here's a look at software products that protect these small devices from invasion.



OneTouchPass

OneTouchPass 2.3 from Softava controls entry into the PDA by touch control. Users identify a series of touch points, in a particular order, on the screen image. That sequence becomes a password that unlocks the contents of the PDA. Users can select any image they want for touch control by uploading a favorite photo or image, or they may use one of a set of screens provided by OneTouchPass.

The touch system overlays the text password. If the wrong touch sequence is entered, the system reverts to requiring a text password. If someone shuts off the device before entering the text password, OneTouchPass requires the text password upon starting again. Also, if a user turns on the PDA and does not see the OneTouchPass screen, he or she knows that the device has been tampered with. According to Softava, even a single-tap password provides more than 99 percent security, so adding multiple tap sequences improves security without adding considerably to start-up time. Contact: Softava, www.onetouchpass.com or www.softava.com.

PDA Defense

PDA Defense takes a different approach to PDA security. To gain access to applications and functions on the PDA, users must enter a password either by typing on the keyboard or by using a hardware button. According to the product manufacturer, start-up time is immediate after entering the password. The product is built on the PDABomb Security Platform, a multi-tiered security system that uses industry-standard encryption.

PDA Defense is available in standard (Palm), professional (Palm and Pocket PC), and enterprise versions (for Palm, Blackberry, and Pocket PC). PDA Defense Standard protects five core PDA applications: address book, date book, to-do list, memo pad, and mail. The professional version adds additional features, including 128- or 512-bit Blowfish encryption which protects all information stored anywhere on the device; application lockout, which prevents unauthorized users from accessing applications without the password; and additional lock, stealth, and bitwiping functions.

The enterprise edition allows an administrator to create versions of the software that make particular security features mandatory or optional. Only the administrator can access or change the instructions. Contact: Asynchrony, St. Louis, Mo.; (314) 678-2200; www.pdadefense.com.

PDA Secure

Trust Digital's PDA Secure, also password operated, is available for Palm OS, Pocket

PC, and Symbian. The software, which incorporates six different encryption standards, enables secure password and data encryption. Users can operate the Palm version in either Local Mode, which locks all applications on the PDA, or Global Mode, which completely locks the PDA itself, forbidding any use. It comes in three product lines: PDA Secure Standard and Premium for individual users, and Enterprise and PDA Policy Editor for network users and centralized managed security. Premium offers more features and encryption algorithms than the Standard version. Enterprise is the client piece and Policy Editor is the server piece of the network edition.

Trust Digital's product lets users define a sequence of touches for identification rather than a password, when that is more convenient. Users can switch from password to touch ID when they want to unlock the device subtly or perhaps in secret, while it is still in a purse or backpack. Contact: Trust Digital, Fairfax, Va.; (703) 246-9198; www.trustdigital.com.

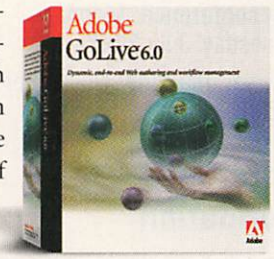
PDALok requires not a password, but a signature to gain access to the device. The use of Penflow Biometric Signature Recognition affords several advantages. For one thing, it's one less password to remember. Signing on and gaining access only takes a moment, even for longer signatures. The software creates a personal profile for each user, recognizing the signature, with its typical variations, over time.

Even though no signature is exactly the same, this software purportedly can identify between authentic and forged signatures. The lock prevents unauthorized users from gaining access to any of the PDA's functions and from synchronizing it with a desktop PC. Users can change their signatures by first entering the old signature and then entering the new one. The software can also be used to sign word documents and to verify signatures that are sent to the user. Contact: PDALok, Bio4 Limited, Hampshire, England; 44 (02392) 627 979; www.pdalok.com.

Adobe GoLive 6: Web Power Tool

Steve Adler
Ramapo College of New Jersey

Ramapo College of New Jersey participates in a federal grant—PT3, Teaching Teachers to Teach with Technology—under which the faculty is learning to create their own Web sites. As a result, they needed a Web-design package that would allow them to integrate all types of Web sites built and designed in every way imaginable. The school also wanted to integrate the latest technologies into these projects using cross-media workflows and to be able to teach essential skills in one uniform environment to empower the rapidly growing community of Web authors.



The staff and students feel comfortable with the GoLive program from Adobe because it allows the visual design and page layout techniques used in other programs to be easily transferred to the users' Web projects. Entire sites can be conceptualized and diagrammed visually. These diagrams are then made live as part of the Web-site design.

Pages made up of templates and components—objects composed of HTML snippets—make revision and site-wide changes simple. If a change is made in a component, all the pages containing it are immediately updated. GoLive ships with a set of complete site templates, which is great for allowing users to explore page mechanics as they build their own projects.

To help build enhanced Web pages containing floating boxes and Dynamic HTML, GoLive uses a timeline editor which is similar to that found in other Adobe applications. In addition, a full QuickTime interactive authoring environment is included.

For incorporating JavaScript, GoLive ships with over 75 different JavaScript "Actions" that are built right into the interface. Assigning and configuring these is done through GoLive's site inspector, the heart of the application. For purists who like to hand-code their JavaScript, GoLive allows its Actions code to be stripped clean of proprietary tags so that custom code can be edited efficiently through the built-in JavaScript editor.

New in GoLive 6 is the addition of variable support to Smart Objects, Adobe's technology for allowing native graphics files to be resampled and adjusted to fit the Web designer's needs. With variable support, the author can open an Adobe graphics image in GoLive, access the text layer as a variable, and generate a new graphic containing the modified text. For those needing quick text banners layered into SWF files, these variables can be controlled through Adobe's LiveMotion 2.

Version 6 now includes greater built-in support for workgroups and ships with a new Web Workgroup Server CD. If you combine GoLive's features with its tight integration and open support for industry-standard technologies, availability for both Mac and Window's newest operating systems, and generous CD resources, you have the basis for a Web curriculum that not only helps to teach effective Web design but also provides the latest tools for teaching Web development in a variety of environments.

Steve Adler works with Ramapo College of New Jersey Consortium for Improving Teacher Training in Technology. He also teaches Web design with Adobe GoLive at the School of Visual Arts in New York City and is Web coordinator and Staff Developer for the Northern Valley Regional High School district in Bergen County, N.J.

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Technology application success stories and exemplary case studies are featured in this track. An opportunity for faculty to share their successes in using technology for teaching and course administration, and administrators and IT professionals to share information about implementions of technology on campus. Clusters offer 2-3 related presentations per session.

- Showcase of teaching with technology: lessons learned
- Adoption success stories: "real world" implementations of new technology for teaching or administration
- Cutting-edge technology and pedagogy
- Collaboration among students and faculty using Web/Internet technologies
- Curriculum redesign examples
- Student perspectives of Web courses and online programs
- Discipline-specific case studies of teaching with technology

Pre-Conference Seminars

In addition to presenters for the main conference program, Syllabus is seeking individuals to lead full- or half-day seminars during the pre-conference, on Saturday and Sunday, July 26 and 27. The seminars are classroom-style presentations that explore education technologies.

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How To Submit A Proposal

Interested parties are invited to submit proposals via e-mail per the following instructions. All relevant proposals will be considered, so if you have a compelling education technology topic related to but not specified in the above list, please feel free to submit a proposal.

Syllabus is now accepting proposals for the following session types:

Main conference sessions

- One-hour breakout session—main conference only
- One-hour panel session—main conference only
- Poster session—main conference only
- Cluster session—2-3 related technology applications presented in one session

Pre-conference seminars

- Half-day classroom seminar—pre-conference only
- Full-day classroom seminar—pre-conference only

Submission Guidelines

Submissions should include the following information:

I. The title of the presentation

II. The proposed format, e.g., breakout session (see session types, above)

III. An abstract of the presentation content (600 words or less)

IV. An indication of the conference track(s) into which your topic would most likely fall

V. A brief session description suitable for publication (one 75-word paragraph)

VI. Name and academic title (e.g., Ph.D. or Ed.D.) for each presenter

VII. E-mail address and phone number for each presenter

VIII. Presenter bio(s) suitable for publication (one 75-word paragraph each—be sure to include current position and affiliation)

IX. Any further information that might be helpful in determining the relevance of your topic to the conference

The final date for submissions is November 30, 2002. Notification of acceptance will be made by January 10, 2003. Proposals will only be accepted electronically.

Submit your proposal by e-mail:

mgrush@syllabus.com

Please include the following in the subject line (where "lastname" is the presenter's last name):

Syllabus fall2003 lastname

Speaker Discount: Presenters whose proposals have been accepted are entitled to receive a "speaker" discount of approximately 35%.

Note: As a condition of acceptance, each presenter will be required to submit, by March 15, 2003, a 1,000- to 1,500-word article for consideration for publication in the conference proceedings, in *Syllabus* magazine, or on the Syllabus Web site.

Syllabus2003

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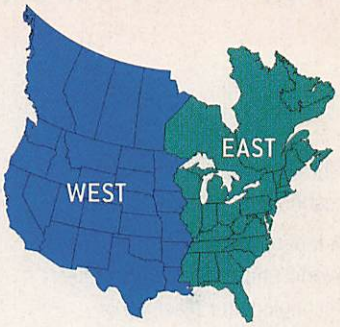

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